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ADVANCED MANAGEMENT

Quarterly Journal

The Society for the Advancement of Management

Colleges and Executive Training

A Management Methods Program

Standardization

Production Control

Measuring a Fair Day's Work

Wage Bargaining

Wage Incentives

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Quarterly Journal

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CONTENTS

Comment 1
What Can Colleges Do to Assist Industry in Training Executives—*A. R. Kelso* 2
What Colleges Are Doing to Assist Industry in Training Executives—*Ralph C. Davis* 7
A Management Methods Program for the Entire Plant—*D. MacLaren Heider* 11
Standardization—Harmonizer of Human Effort—*Douglas F. Miner* 15
Expediting Deliveries Through Production Control—*M. G. Demougeot* 23
Progress in Controlling Production—*John A. Willard* 25
Management's Search for Precision in Measuring A Fair Day's Work—*J. K. Louden* 27
Labor Views the Working Day—*Solomon Barkin* 32
Give and Take in Bargaining on Wages—*John R. Steelman* 38
When Wage Incentives Fail—*Charles A. Drake* 42
Leon Pratt Alford 44
Reviews 46

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Comment

SPLENDID examples of member service and of public service have recently been supplied by two conferences of SAM. The regular annual conference was wisely conceived and ably supervised to clarify the problems of general management in relation to new war and even post-war problems and outlooks. The deliberations were at the level of broad, long-term thinking about where we are at, what we should be doing and how we should be planning.

The New York Chapter conducted the recent conference which centered about methods of payment with special relation to war influences. The discussion was specific and practical. It got down to cases. Many voiced the feeling that great help in tackling difficult adjustments had been supplied.

Papers from both these gatherings compose this issue. They well illustrate the dual role of such a body as ours. They exemplify our task of pioneering, economic and industrial thinking in the realm of principle. And they show that we are able as well to concretize our thought and pool operating wisdom for wider applications by others.

Both tasks are essential: to do the latter without the former is to become solely a body of technicians in the lower ranges of managerial effort. To reflect and generalize only is to keep so far above the battle that the urgencies of action and the need for workable procedures may be ignored or misunderstood. To keep the general related to the particular, to let theories derive from an evaluation of experience—this is to be mature, basic and adaptable in the conduct of one's own thought, and no less in the conduct of such a Society as this.

Peculiarly today, whatever might be our wish, it is impossible for a body committed to the advancing of good management to live unto itself alone. Our conferences, for example, have as many, if not more, registered who are non-members as who are members. Our Journal goes to a long list of libraries where its files are in active demand by students, teachers and executives.

If this function needed any further justification, which it does not, it would be well to remind ourselves of the truth to which Walter Lippmann gave recent expression, that "the immense scope and depth of American reserves require leadership and administration and management of a much higher character than are needed to mobilize a smaller and poorer nation."

It is to help supply in every way we can more management effort of the highest possible caliber that this Society essentially exists. We second wholeheartedly the telegram sent by Mr. Loudon, our president, to President Roosevelt on December 7, 1941, to the effect that our members "renew their pledge of full co-operation and service to you as our country's leader to use as you see fit."

Such a declaration implies consecrated personal contributions by men and women who have much to give toward all-out production. And it implies also a certain missionary zeal for which this Society has always been conspicuous. There is a phrase from another area of activity—the propagation of the faith; and in a real sense we are the Society for the propagation of the faith in enlightened management thought and practice.

* * *

An as yet unrealized responsibility of management has to do with a fuller understanding by and eager sharing in the aims of the war, by the rank and file of American industrial workers. There is no question whatsoever of willingness, of co-operation and of hard work, where the assignment is known and the matériel is in the shop. At the level of factory performance the capacity of our fellow-citizens down the production line promises to shake the world.

But there is reason to believe that far beyond the "Remember Pearl Harbor" slogan, there is a job to do of generating confidence in the institutions of a democratic country, of showing how they would suffer and be destroyed by an Axis victory, of having every worker from top to bottom know deep in his heart that it is both his own personal life of self-respect and his community life of free and equal association with his fellows, which are crucially at stake. That there is a tremendous *difference* between democratic and totalitarian aims of world control, a difference that touches closely every individual—this is the message we have still to drive home.

The ways and means of doing this essential job remain to be discussed. Of this more anon. What is *your* company's way of meeting this challenge?

ORDWAY TEAD.

What Can Colleges Do to Assist Industry in Training Executives[1]

By A. R. KELSO

Assistant General Manager, United States Cartridge Company, St. Louis

IT IS a challenge to any industrialist to be invited to speak before The Society for the Advancement of Management, and particularly before the session sponsored by the teachers of management. The founder of Scientific Management, Frederick W. Taylor, was a great industrial teacher. The training of young men for future executive positions is essentially a teaching job, but it must be based on the scientific principles he laid down.

We in industry are vitally concerned with the shortage of capable executives. A great deal has been said about shortages of materials, machines and men. Everyone is concerned about our lack of trained men, and industry is now engaged in employe training intensified to a degree never dreamed of before. This training, however, has dealt mainly with mechanical skills, with some few companies broadening their training programs to include foremen or first-line supervisors. But the major problem remains, where are the executives coming from? *Their* decisions and actions will guide and control the employes now being hired and trained. This is not merely a temporary problem, for, while we need capable executives today—many of them in the new industries and plants springing up overnight—the need for soundly trained executives will be accelerated in the years to come when we will have to make the difficult adjustments required in a post-defense period. Then indeed will our executive selection and training programs be tested.

Industry for many years now has been relying on the colleges and universities of this country as one of the chief sources of potential executives. These are the men we expect eventually to move into major executive positions. If this program had been satisfactory, I would not be here before you. We all agree that many of the men drawn from colleges and universities into industry do not develop as rapidly as they should. Because speed is the essence of executive training programs today, it is essential that these young men, when they leave college, be thoroughly prepared to enter industry, thereby shortening their training period in industry. Industry does not expect fully trained men from college. It expects them to serve an industrial apprenticeship before they take executive responsibilities. Moreover, it expects they will have had inculcated in them the spirit of co-operation—for there is no place for the individualist on an executive staff in modern industry. Effective co-ordination within the business organization demands a high degree of co-operation from the individual. It demands a team spirit, a willingness to submerge the individual interest, temporarily at least, in order to achieve the greater objective.

It is the men who will become our future executives that we wish to discuss. When the colleges graduate them, it is still necessary for them to serve an interneship, a training period or apprenticeship. We do not expect them to come to industry fully trained. Neither does industry want to retrain them completely. Together we have a job to do—the colleges to prepare them for us so that the training we give them can be most effective.

The change-over from college life to industry is frequently a difficult period for the young man. This is a problem the college can do much to solve. There are men here from institutions which now use the "co-op" plan in their engineering schools. This plan makes the transition from school to industry easier, because the students are being prepared over a period of several years to make the change. Early in their college training these students learned to deal with *real* things, not *ideal* things. They have made the transition from *theory* to *practice* gradually. On entering industry they are more adequately prepared to develop rapidly from executive material to executives. Unfortunately, the schools using this educational plan are in the minority, and far too many college graduates are still theorists unable to see how they can put their education to work to their own and their employers' mutual profit and benefit.

The automobile industry has learned to make its an-

[1] Paper presented at the Annual Conference of The Society for the Advancement of Management, December 4, 1941.

nual model change-over with a minimum loss of time and manpower,—but it took a lot of research and experiment to find the best way to make the change. The colleges can profit by their experience. They must recognize their responsibility to their students and to industry to find the solution to the problem of making a more rapid change-over from the textbook period to the working period. Theirs is the job of preparing the college student to make the transition from dealing with abstract principles and ideal things to working with real things under the very real conditions existing in industry.

We hear a great deal about the scientific approach. It is taught to students. Have the colleges tried to apply it to the question, "What can colleges do to assist industry in training executives?" They have a research program ahead of them. First, they must go and find out what industry needs in its executive material. Study the men in industry who left college five and ten years ago, both the successes and the failures. Why did they fail or succeed? Have they met the needs of industry? Second, analyze curriculum in the light of the facts discovered about industry's needs. If changes are needed, they should have the courage to make them. In industry and in our schools we cannot afford to be passive; corrective action must be taken where needed. There have been instances where committees of experienced men have been appointed to study these problems and recommend changes. Their reports have been written, read, filed, and no action taken—a maneuver that has no place in modern industry, and especially in private enterprises. Third, they should take inventory of college personnel. In the light of the facts of industry's requirements, and the courses which will be given to meet those requirements, are college staffs adequate in numbers and experience? Colleges will have to practice what they teach. They teach the scientific approach—the research method. They train students to be research-minded, to get the facts, to analyze those facts, to make decisions based on the analyses, to plan to put those decisions into effect, and then to take action to put the plan to work. The method taught is the method needed to answer the question we have before us today.

What is industry looking for in its prospective executives? There are certain essential qualifications. All young men entering industry, who expect to rise to executive positions, should be well-grounded in the fundamental and basic principles of industrial organization and management, industrial relations and accounting. Conditions change over a period of time. Our present conditions are far different from those of the twenties. Are the theories taught in tune with the times? As an example, are the industrial relations principles based on present-day labor conditions? But even knowing and understanding sound principles isn't enough. Industry needs men who understand the practical application of these principles, men whose training has combined modern theory with current practice. The need is for men prepared and ready to make the change from school to industry, from theories to practice.

Our problems arise from the necessity for retraining men who have had courses in management, but who fail to understand the lines of authority that exist in industry for good and sufficient reasons. They fail to see the relationship between departments—the relative value of each sub-unit to the whole structure. Our troubles are with the men who have had accounting courses, and have the theory of cost accounting at their fingertips, yet who see cost accounting *only* as an isolated department, not as a *tool* used in everyday work. Rarely does it occur to them that the costs in their department, and their advancement and pay increases go hand-in-hand. The college-trained man should be cost-conscious, not merely trained in accounting.

The young man fresh from college should also be able to *sell himself*. So few of our college graduates today know how to ask for a job, either in person or by letter. I wish you could see some of the letters of application that pass over my desk from college trained men. Actually these men do not know how to organize and present their ideas on paper. Many of the personal interviews I have had with college graduates are equally unsatisfactory. Too often college men are unable to organize and present their qualifications in conversation. Some colleges today are introducing courses in effective letter writing. Evening schools offering courses to men employed in the daytime early recognized the need for such courses and made them available. Look at the evening school courses demanded by men who spend their leisure time on additional education. These men know what they need and what they want. The courses offered in evening schools are a good criterion of what many young men in industry find they failed to get in college and elsewhere during their schooling. Study the attendance in evening school courses.

Ability to talk and write forcefully, with ideas well organized, is essential to every executive. We look at every young man who seems to be executive material

to see how effectively he can express himself orally and on paper. Many a young executive trainee fails because he has never learned to write a clear, concise report. Many another falls by the wayside because he cannot talk on his feet. Emergencies occur when a young man must think through a problem rapidly, organize his answer and state it clearly to a group of people. Frequently he has to think as he talks. *This* is training the college can give him.

To qualify as executive material, the college graduate must have a sound and well-rounded training. Our engineering schools turn out engineers soundly trained in engineering—but they are almost totally lacking in knowledge of how to handle men or analyze a balance sheet. Only a few of our engineering graduates go into research work. Most of them find positions requiring not only the use of their technical training but also the ability to manage men and costs. Yet this phase of their training is almost entirely neglected and the problem is left with industry. The junior executive needs training in handling people whether he is in the shop, the accounting department or the sales department, but only the college men specializing in personnel and management seem to come to us with any knowledge of fundamentals of selecting, training and guiding people.

We find that the man who has worked his way through college progresses more rapidly. He has learned the value of the dollar before he comes to us. He knows salary and wage ranges and about what remuneration he should receive while in training. You would be amazed at some of the starting salaries expected by college graduates who have not had this experience. When they are disillusioned, it creates an additional hurdle in their training program.

To me one of the most important things that the college man should learn in his education is to determine his goal and plan his path to reach that goal. A number of years ago, my paper "Blind Alley or Thoroughfare" alluded to the route a young man traveled in attaining his goal. So many of our young men leave college, get a job, and let nature take its course. A considerable number of them wind up in a blind alley. They don't know what they want, where they want to go, or the path to follow in getting there. As part of their educational experience what they learn and see should give them the knowledge to help them set their goal.

I believe that a young man in his early years out of college should get a variety of experience to prepare himself for an executive position. A young man—son of a good friend of mine—was sent to me several years ago. He was finishing his last year in one of our top engineering schools. He told me he was considering returning to school the next Fall to do graduate work. I told him he had enough education for the present; he needed to set his goal and get started toward it. Later, if he found he needed additional training, he could return to school. He went to work for a large corporation in its control laboratory. A year later I again talked with him. He had made a little progress and seemed satisfied. I told him he had gained enough knowledge from his experience with that company, and should get out and find another job with another company. As a result he made several contacts and came back to me concerning one of them. It was a position offering good experience but he had looked up the Company in Dun and Bradstreet and discovered that their rating wasn't so "hot." I told him he wasn't going to work for them the rest of his life but only a year or so, and, if the job and the experience was on the path toward his goal, to take it. Since then he has made one other change and is now a top young executive in his field. He hadn't been taught, as part of his education, that a man has to set his goal, and plan to reach it. I like a man whose early experience was in a number of different positions. His training has been broadened by his varied contacts. Yet, so many young college men today leave school without a goal—without a plan—seeking a job with one company and expecting to stay with that company for the duration of their careers. Experience makes executives. Sometimes experience comes with a single company, but more often the man with a goal and a plan realizes he must occasionally change positions to hasten his progress toward his objective.

When colleges do a research job on what industry expects in the young men it seeks as potential executive material the researchers will find that many other qualifications are in demand. One is the need for men who can accept and work under discipline; men who can take orders and follow them. Another is the requirement that the men be good team members, able and willing to co-operate—co-ordination minded. There is no place in a group of potential young executives for the egoist or the "lone wolf."

As the next step, colleges should analyze the courses they give, the program the prospective young executives follow in college. Do these courses have a practical slant, or are they very nearly pure theory? If they can't give their students actual training in industry as

the "co-op" schools do what are they substituting? Do they have frequent opportunities to visit industrial plants? Are these visits made in the form of large sightseeing safaris, or small, observing, question-asking groups? Do they have speakers from industry, experts in their fields, as part of their courses? Are they taking full advantage of the opportunities around them—the industrial plants in their cities, to tie the practical side into the textbook theory? Do their courses use industrial experience in the form of case problems? I know that some of the colleges *do* take advantage of these things.

Industrial experience in the form of case problems should be an integral part of every course they offer. This is one way they have of making the transition from college to industry easier for the college man. The use of the case method meets the objection so often advanced by industry that the college man is impractical. It ties the principles learned from textbooks into the practical application of these principles in industry. With rare exceptions, textbooks are woefully lacking in case material. The case approach is the way to train our future executives to deal with the real problems that exist in industry. But remember—cases *must* deal with today's problems. Cases should be kept up to date and they should be solved on the basis of current conditions, not as we used to solve them. Some of you come from institutions which are now using the case method. You know how eager industry is to hire your graduates. The success of institutions where either the "co-op" plan or the case method is used should indicate to others the value of this type of training.

As part of the college's research job it should examine the textbooks it is using. I know of one institution that was using a book eleven years old for its text in Personnel Management. You know, and I know, that the personnel problems in industry have changed tremendously in the past eleven years. In the light of legislation of the past few years and of the changed and changing status of labor our whole philosophy of Personnel Management has been completely revolutionized. If history in the labor movement repeats itself, as history usually does, there appears to be little hope of being able to stabilize our whole philosophic approach toward the entire personnel problem. To add to the complexity of the situation there is the multitude of problems arising out of the effort to gear industry to meet the demands of the war. Many of the textbooks now in use show that the authors are out of touch with present day industrial practice and problems. In fact, the whole matter of Industrial Management and Industrial Relations has been in such a state of flux that it has been virtually impossible to bring out a textbook that would not be obsolete by the time it was printed. The texts used should not only present well-established principles but should describe how they are put into practice under actual industrial conditions. A few of the most recent texts meet these requirements admirably but most of them fall far short. The material is available from industry but the colleges will have to ask for it. Industry is not going to volunteer to give it.

As colleges study the text material in use they should examine their whole curriculum. Are there courses that should be eliminated and others that need to be added? Can some courses be condensed and streamlined so that the young man is given only basic principles, and is told where he can find additional material on his own if he is interested in continuing study in that field? There is the job of selecting those courses which are pertinent to preparing him to meet the standards set up by industry. Some institutions devote the entire four years of college life to courses in the industrial field. Others use only the last two years of college life for teaching industrial courses. Only research can determine which is the better practice in terms of industry's requirements. I do not mean by this that industry is seeking young men who have been trained *only* in the field of commerce. The young man entering industry as a potential executive needs the basic principles of economics, of English, of psychology, and other courses as well. His education should be well rounded, but to what extent non-technical courses should be included in the training program depends upon the facts that are uncovered in a research job of what industry expects of the young man hired for executive training.

When we have the facts on what industry requires in its potential young executives and colleges have examined the materials available to meet these demands, then they should examine teaching methods. Are the methods used in teaching English courses the ones that should be used in teaching Management? Teaching methods, like mechanisms, should be examined at regular intervals to see if they need to be overhauled. Industry is adopting the conference method of training executives. To what extent are colleges using this technique? The traditional lecture method should be reexamined in the light of research.

In the beginning I set forth certain steps to follow. The last of those was "take inventory of the college personnel." In industry we take periodic personnel

inventory. Jobs change over a period of time and the man who was once the right man for the job may eventually become the wrong man. Is the staff adequate in numbers and in experience? Are the classes instructors are required to teach too large for them to do a good job? Do instructors teach too many classes, thereby preventing them from making frequent and regular contacts with the problems of industry? If this is true they cannot be expected to give their students an up-to-date viewpoint. Colleges have been criticized all too often for using immature instructors whose sole knowledge of the business subjects they are teaching is derived merely from what they have read. Often these same instructors would not recognize the things they teach, should they see them in actual use. A university would not permit a man to teach medicine who was not himself a doctor. Are colleges violating this principle in the men who teach Industrial Management, Industrial Relations or other business subjects? Do we have on our faculties instructors who have never worked in the field they teach? I know of a young man who received his Master's degree in Industrial Management this past summer. He is today teaching Industrial Management in a large university. Yet, he has never worked in industry. He can't possibly adequately train his students to step into desirable jobs in industry.

To my way of thinking, every man teaching in the business field should have worked in industry at the kind of work he is teaching. Further than that, professors and assistant professors should frequently return to industry to keep in touch with the changes that go on. Does a man who for the past ten years has been teaching students Industrial Relations meet the demands, when he has had no experience in industry during that time? I know many professors among the SAM members are consultants as well as teachers. Where would they be, if they had to go back to the book for the answers? Their experience gives them the case problems, the conditions, and the answers to use with students. That is ideal, but it applies to only a limited number of teachers. In my opinion a man is not equipped to teach in the industrial field unless he has not only worked at it but also has worked at it *recently*.

Are we getting the best possible men as teachers? There is competition for good men. Industry is crying for experienced men in the same fields where colleges need them. Are they disposed to meet this competition financially? I am asking these last questions because we in industry are vitally concerned with the qualifications of the men we are training for our future executives. The qualifications of these men will depend to a large degree on how well qualified the men are who teach them. We must have the best possible men as instructors, but to get them colleges will have to meet the competition from industry.

There came to my attention recently a letter written by a college executive seeking help in locating a man to teach in an industrial engineering department, experienced in motion study and plant layout with enough experience to know how motion study and layout work are carried on beyond the textbook stage. The specifications were prime but the salary offered was not of a level to attract a competent man from industry. Offered also was a chance for advancement. However, in our own Employment Office we would pay substantially more than the amount offered by this institution, and *also* offer a chance for advancement. This is not to be construed as primarily an appeal for an increase in salaries for college instructors, but any realistic approach to the problem will show that teachers' incomes must be comparable to those offered by industry, if we are to get the best men on faculties.

You who represent the colleges have a great job ahead of you—and it needs to be done immediately. Go out and get the facts, find out what industry wants in its young men who are to be trained as executives. Adjust your programs to meet the facts. Review and revise the materials you will use in terms of the facts you uncover. Look at your teaching methods. Study your personnel. Are the men you have on the teaching job the best qualified men to train future executives? Industry will give you every possible aid in furnishing the facts; then it will be up to you to develop the conclusions and plan to put them into practice. The need is immediate. The facts are available. It rests with you to go to work.

What Colleges Are Doing to Assist Industry in Training Executives[1]

By RALPH C. DAVIS

Professor of Business Organization, Ohio State University

OF COURSE there is no possibility of co-operation in executive training unless industry has certain training needs that the colleges are competent to serve. Our first step, therefore, is to determine the nature of these needs and their requirements. On the basis of our experience to date, the following appear to be the more important:

(1) A supply of executive raw material that can be developed quickly to assume minor supervisory responsibilities,

(2) A smaller number of trainable people who have sufficient potentialities to warrant their development for higher positions on the levels of operative or administrative management,

(3) A maximum up-grading of present industrial personnel of all ranks in the shortest possible time, and;

(4) Assistance in the solution of specific training problems, or related problems of an organizational nature.

This statement of needs is based on the assumption that for some time to come industry will be engaged largely in serving the war needs of the nation.

No doubt everyone who has any connections with industry knows that its efforts to expand its operations are hampered by shortages of competent line and staff executives in our manufacturing divisions. When and as we can get them, more operatives, materials, machines, floor space, and other production factors may mean little unless we can also develop quickly the necessary executive leadership. The colleges have large pools of young men and women. In general, they are above the average in intelligence. They have been in the training process for many years, and their minds are flexible. Many of them have acquired backgrounds, as a result of their college work, that can be used by industry with a minimum of additional training and experience. The faculties of our colleges include many men who have had practical experience in industry, as well as years of experience in education and training. The basic requisites for effective assistance in the solution of many of industry's training needs are present. The colleges should be able to make an effective contribution, and most of them are. This is particularly true of those schools that have well-developed schools and colleges in the fields of engineering and business administration.

I shall use my own organization, the Ohio State University, to illustrate what is being done. In so doing, I am not implying that we are doing the outstanding job in the United States. It is probable that we are merely typical of the good job that is being done by every major educational institution.

With the outbreak of war, the President of the University, immediately appointed a defense committee. It has surveyed the resources of the University and has catalogued those that might be applicable to defense purposes. It has assisted in co-ordinating various defense activities that were previously in operation, and has served as a focal point for co-operation with state and federal defense agencies.

The university co-operates with the United States Office of Education in the operation of the Engineering-Science-Management Defense Training program. The Director for this region is the Dean of our Engineering College. The engineering courses in the program are given under the general direction of the Engineering College. The courses in science come under the general direction of the Arts College. The management courses are under the general direction of the College of Commerce and Administration. So far, the various courses offered have been set up principally for the specific purpose of assisting industry in developing a supply of potential supervisory executives or technical specialists. However, we have offered a few courses in production control and personnel management that have served as refresher courses for major operative or staff executives. In setting up these courses we have gone to committees of executives in each of the cities where courses are given. It is the function of these committees to tell us what are the local executive

[1] Paper presented at the Annual Conference of The Society for the Advancement of Management, December 4, 1941.

training needs, and to outline the kinds of backgrounds that their employes need to enable them to absorb quickly the intensive training that they will be given subsequently within the plant. These committees are composed chiefly of competent, experienced personnel executives. Nevertheless, it has been our experience that usually they are unable to give us the information that we need. We find ourselves being forced to suggest various courses that may be helpful. As a result, we have an excellent example of getting the horse before the cart. However, this is not a criticism of industrial personnel executives. It is almost impossible to tell what departments will expand at what rates; to determine what functions must be differentiated distinctly or completely to form new sections or departments, and to answer other related questions, when the Government's demands as to kind, quality, and quantity of production are changing rapidly from day to day.

Like many other colleges, we co-operate with the Training-Within-Industry Branch of the War Production Board. The writer is a member of the Columbus Panel. This is a voluntary service that is intended to assist manufacturers in the Columbus Area in the solution of those problems having to do with the training of operative employes.

In the Spring, the College of Commerce and Administration will run a number of conferences, or "institutes," for executives. This is not strictly a defense activity, since we have run them for years. However, they tie in directly with the current job of expanding industry. They offer a forum in which executives can discuss their mutual problems, and provide other values that are important at the present time. We have scheduled conferences for trade association, accounting, and personnel executives in Ohio to be held at the College in May 1942. The attendance will vary from forty or fifty in the case of the trade association executives to five or six hundred in the case of the accounting executives.

Mr. Kelso's paper dealt largely with the problem of developing a high quality of executive raw material for positions above the rank of first or second-line supervisor. In the College of Commerce and Administration, this is the principal responsibility of the Industrial and Personnel Management Division. We feel that we can meet most of the objections raised by Mr. Kelso, and that most recognized collegiate schools of business administration can meet them also. We require our majors in industrial management to take the usual basic courses in economics and business organization. In addition, they must acquire a good working knowledge of general and cost accounting. On top of this they must take various courses in elementary industrial management, supervisory management, production control, time and motion study, personnel organization and management, materials, purchasing and inventory control, office organization and management, industrial psychology, and various others of a professional nature. However, we limit definitely the amount of specialization that we will permit. Undue specialization means an excessive amount of time spent in mastering detailed techniques.

Many of the managerial techniques that are in use today probably will be obsolete before our graduates have risen to positions of sufficient authority to do anything about them. Furthermore, the detail of managerial techniques varies greatly between concerns and branches of industry. The techniques of production control in a tool and die shop are not likely to be of much help to a man whose first job is in a shoe factory. In such case, the recent graduate has too much to unlearn, and there is too much that his employer has to knock out of him. We feel that a better professional training is obtained by approaching problems in the various management fields on the basis of those fundamental principles underlying the planning, organizing and controlling of human activity in any industrial organization anywhere.

We try to impress on our students the fact that we do not develop executives; that at best we can only develop a good grade of raw material from which executives can be developed, provided that the student has certain innate qualities that are necessary for executive leadership. They must be prepared to earn their Ph.D. in practical experience in industry. We urge our seniors to analyze the requirements for advancement that they must meet in the concern with which they become associated after graduation. It is hoped that they will have enough common sense and ambition to govern their self-development accordingly. If they enter a metal-working concern and find that they should have a greater knowledge of elementary machine design to enable them to work intelligently with the company's engineers, or some other knowledge to work with some other group in the organization, obviously they should enroll in the company's school or in the night division of the local city college. Almost every large city has such a college today. In most cases, it does a good job of serving such needs.

It should not be concluded that our students wander

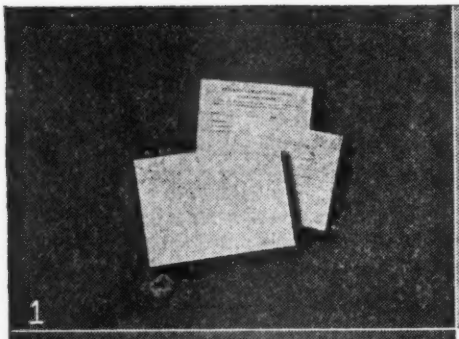
around in a pink haze of organization theory, until finally they land on someone's payroll. Mr. Kelso has suggested that management courses should be taught by the conference training method. All of our management courses are conducted on a conference basis. We usually require the student to buy a text. However, it is used chiefly as a personal reference book. A pure conference technique cannot be used unless the members of the conference have had considerable experience, since it presupposes the existence within the group of sufficient knowledge for the solution of the particular problem under discussion. The average student has little background in the field of management, and usually no practical experience. It is necessary therefore to provide the required background and some statement of pertinent experiences as a basis for conference discussions. Of course we select texts that are up to date. We also use a modified form of the case method of teaching. We have developed short, "stream-lined," objective-type cases. They give the student an opportunity to exercise judgment in the application of management principles, and test his ability to do so. Extraneous material has been eliminated as far as possible, enabling us to cover more problems with more cases than otherwise would be possible. We do not have a course devoted to field trips. However, during the year we always run a number of trips for our management students, through local manufacturing plants. We have a student organization known as the Industrial Management Club. Once or twice each month, a purchasing agent, production manager, or some other industrial executive from a Columbus plant is brought before the club. The executive is not expected to deliver a lecture, but to present informally his problem as it exists in his plant. His presentation usually is followed by a lively discussion by the group.

We do not operate co-operative courses. More than 40 per cent of our male students work their way through college. Many of them work in factories. They do not hesitate to bring their experiences into the classroom, and to question a statement by their instructor with which they disagree. We encourage them to do so. In many cases, however, they have a tendency to reason from their limited, personal, operative experiences to managerial generalizations. As would be expected, these generalizations often are unsound. However, the resulting discussions usually are interesting, and are helpful to the whole group. We also have a summer field-work course. In general, we do not permit students to register for this course unless their work is average or better. It involves co-operative relationships with Ohio industries, although it is not a co-operative course in the usual sense of the term. At the present time we are working on the problem of developing more formal relationships with Ohio industry than we have had in the past.

Mr. Kelso has urged that we ask our graduates to tell us where our courses are weak, in the light of their experiences, and how they can be improved. For many years, we have held an annual conference of Commerce College graduates. Many of them return each year. The original objective of the conference was exactly that which Mr. Kelso has in mind. The idea is better in theory than in practice. While many graduates come back, not many of them come through. It is too much, perhaps, to expect them to be skilled analysts of educational problems as well as business problems. Of course, we get some good ideas occasionally.

There is not much that we can say concerning the complaint that many college graduates cannot write a good letter or report. It is true that many of them cannot. We require our students in every major field within the College to take certain basic courses in English. They must also take a course in business communications that is given within the College. The man who gives the course has served successfully as a consultant in business communications for many large corporations. There is no question concerning his competence or practical knowledge of the problem. Nevertheless, we still have graduates who cannot write. We have no satisfactory answer for the problem. We suspect that it may go back to a lack of proper foundation training in our high schools.

As we stated in the beginning, we do not pretend to develop executives. It is not possible because there are too many factors in the problem that we cannot control. A competent executive must have intelligence, certain innate qualities of leadership, professional background, training both general and specific, experience, and maturity. We have only a limited control of the intelligence of our group. We can do little about the matter of leadership attributes. We can give the student a fundamental professional background and some general training. Specific training and practical experience usually must be gained on the job. Maturity, and certain qualities of judgment that come with it, are a function of time over which we have no control. We feel, however, that within the limits of our problem we are doing a good job of developing executive raw material for industry, and so are most colleges.



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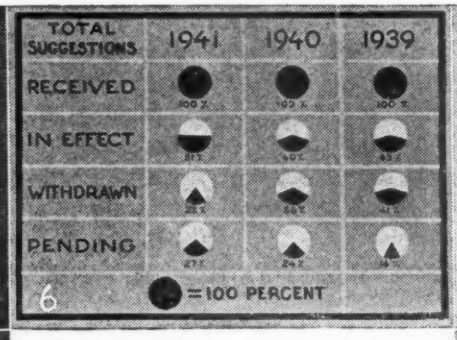

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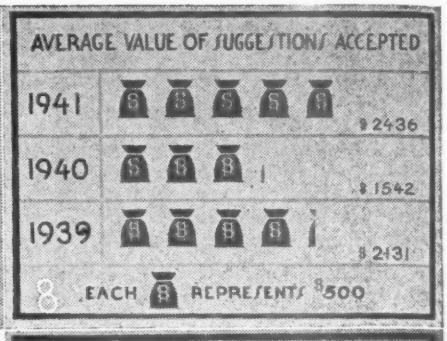

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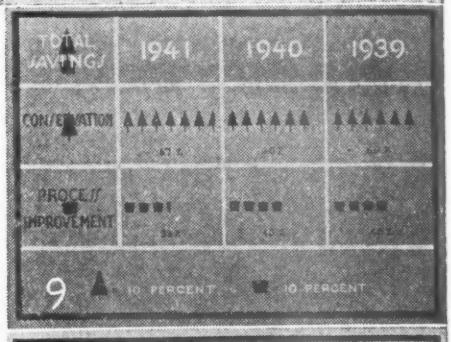
2

METHODS RESEARCH a CHARTED SUMMARY

1. For each suggestion, a folder.
2. Typical Poster.
3. Sample Bulletin.
4. Publicity figures.
5. Pocket Secretary.
6. Going Up.
7. In proportion.
8. Object: Fewer, better.
9. The old and the new.
10. Materials win.
11. Accumulative: 175%.
12. Two thousand fold.



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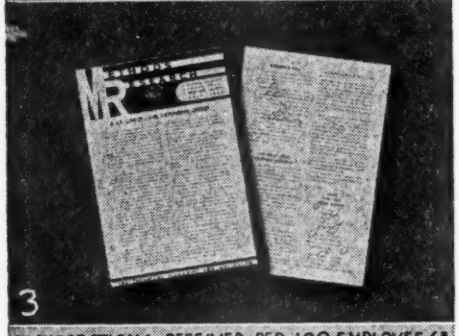

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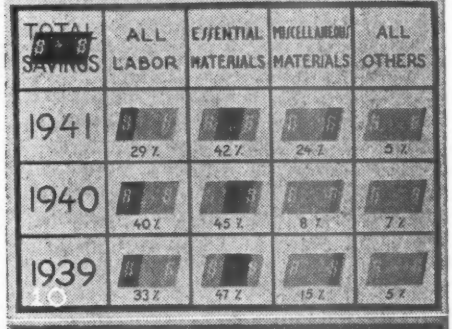

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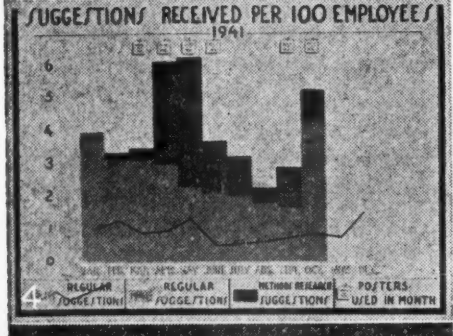

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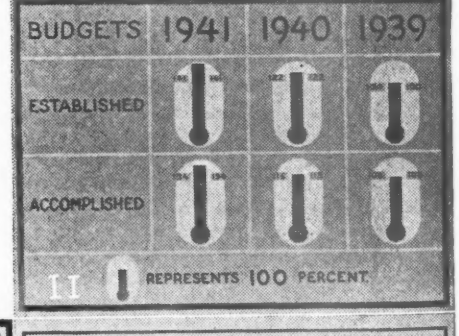

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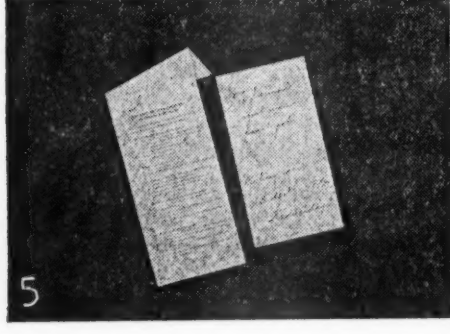

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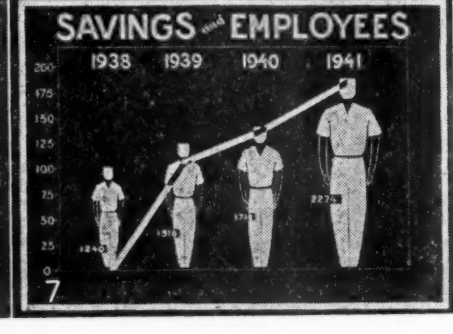

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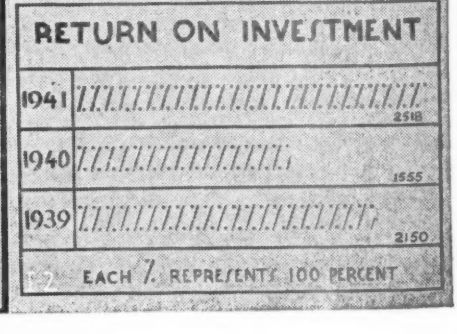


12

A Management Methods Program for the Entire Plant

By D. MACLAREN HEIDER

Industrial Relations Superintendent, Plastics Department, E. I. du Pont de Nemours and Company, Arlington, New Jersey

A condensation of a paper presented at the annual conference of The Society for the Advancement of Management on December 5, 1941.

On the opposite page are some of the pictographs and illustrations used by Mr. Heider in the original presentation of this paper.

The term "methods" used in this paper means "better ways to do better things." And we shall assume that supervisory organization relates to the entire management down to and including the foremen. All of our attention has been directed to this group in our methods work and our foremen have joined hands with management in this common problem. You can then appreciate the dual title, "A Management Methods Program for the Entire Plant."

IF WE were to describe our methods program in a few words, we might call it "a continuous cost reduction campaign evolving ever greater objectives for and by the members of our management."

Our program as here outlined is described merely to furnish an example. Admittedly, it isn't perfect. You are at perfect liberty to reject any or all of the ideas we employ. On the other hand, if you can put some of them to work, we shall feel that our efforts have not been in vain.

There is a reason and a beginning for everything. The origin of the Methods Research work at Arlington was the generally unsatisfactory business year of 1938. It was imperative that something be done and we recognized that it wasn't a one-man job.

It was apparent that a staff relationship would be necessary to insure success, and we considered our first objective as that of training our Standards Engineers so that they could function in the capacity of advisors. This training comprised our entire efforts in 1938.

Our first formal program in 1939 helped us to get into the black. We began it with a series of weekly meetings for the supervisory and technical groups. At the conclusion of these meetings, our area superintendents established their first budgets. Before several months had elapsed, they had doubled these budgets and the actual accomplishment astonished and staggered all of us.

We made a report to our general management on the results of the program. We received a letter congratulating us and containing the following paragraphs.

"It is the goal of the Plastics Department to be the leader in the rapidly expanding and highly competitive plastics industry. In order to accomplish this aim, it is necessary that we be constantly on the lookout for every possible improvement in processes involving both old and new plastics and also in the elimination of waste wherever it occurs.

"We hope that your Methods Research Program will be continued and that the future results will bear favorable comparison with the 1939 accomplishments." (See Chart No. 7.)

Frankly, we didn't think it was possible to continue each year to make the savings we did the first year. (See Chart No. 10.) We thought we had done a real job and could rest on our laurels for a while. This statement from our management was a challenge which made us realize the necessity of finding out what made this campaign so successful.

We went to our area superintendents for the answer. They pointed out the things that helped most, and we were then able to develop the following fundamental principles.

1. It is a *big business* itself and it must be looked upon and organized accordingly.
2. Methods work must be considered a part of the *daily work* of each member of management.
3. Every member of *management must be sold* on the program.
4. Each member of management should have a *quota* of savings to accomplish as his share in the total responsibility.
5. Regular group *follow-up meetings* are helpful provided the man in charge of the area actually conducts the meeting.
6. Every *suggestion should be followed up* actively.
7. The program must be conducted on a *fair basis* at all times so that the competition is equal.

8. There should be *no direct awards.*

9. Amateur or home-made publicity does not have the same effect as *professional* work.

10. *Advertising and sales promotion* techniques are essential.

In order to establish a true perspective of this activity in its relationship to the business as a whole, we should keep in mind that considering a 20 per cent return, every $200,000 worth of savings represents the gross markup on $1,000,000 worth of business. Therefore, if we save $200,000 for the company, it is equivalent to $1,000,000 worth of sales.

Now, just a word about our name. We selected "methods" because the term "work" indicates labor or effort only, while "methods" covers not only labor and effort, but materials as well. The word "research" conveys the thought of "constantly seeking new ways of doing things," and the word "program" was selected because it is synonymous with "organized approach." This title "Methods Research Program" was adopted as a permanent one in 1940 and will be continued.

The director of every activity is the Methods Research Co-ordinator. He is responsible for all the fundamental planning and publicity. He is the ringmaster and must have all the showmanship, alertness, and leadership that you see demonstrated under the biggest of the "big tops." He is the key man and if he fails in his duty, the entire program will bog down.

Assisting the Co-ordinator are the Standards Engineers. They are assigned to specific areas permanently to provide all types of Industrial Engineering service. They serve as the connecting link between the Co-ordinator and the area superintendent. They follow up all suggestions, calculate the savings, and render every assistance possible to the management in the specific area. Fundamentally, they are methods consultants.

As we indicated previously, it is our belief that the primary responsibility for this program should rest with the line organization. This is fundamental to make cost reduction work a day-to-day activity. There are twelve areas in our plant, and in each one of these areas, a meeting is conducted every two weeks. The superintendent of the area acts as the leader, and the Standards Engineer is a participant only. These meetings last for one hour. They are considered one of the most essential parts of plant operation. Records are made of the proceedings so that the various items or suggestions may be followed up. They are conducted as near to the job as possible. This helps to emphasize that Methods Research is part of the daily job of all members of management.

There is considerable thought stimulation in such a meeting. The men involved become cost conscious. As a result, suggestions begin to appear covering not only the items discussed in the meeting but also thoughts that materialize later.

Let us see what happens to one of these suggestions. In order to make these effective, it was found that an organized handling procedure was essential. A folder is kept which bears a serial number. There is also a suggestion blank, and a progress sheet. (See Chart No. 1.) The suggestion is assigned to the Standards Engineer of the area from which it originated, and he is charged with following it through to completion. He must determine its acceptability as soon as possible; then calculate the savings. From week to week the Co-ordinator goes over the tickler progress sheet and checks with the Standards Engineer. After the suggestion has been accepted and the savings determined, a record is made for publication in our Methods Research Bulletin and then it is filed in the folder mentioned. Of course, it sounds simple, but frequently there are complications of one sort or another. It may be necessary to discuss the suggestion in one of the area meetings or construction material may delay the final installation. However, the importance of the clerical follow-up cannot be overemphasized.

A word about another important part of our program —the sales promotion angle. There isn't anyone who won't admit that the successful way to sell a product to customers is to advertise and promote it. We felt that there are a few advertising principles that we should put into practice. (See Chart No. 2.)

We try to convey a single message over the entire plant at the same time.

We place the message where there is the most traffic and we never allow the publicity to be posted too long.

We post a hundred copies of each message in poster form around the plant. Generally, we plan on at least twelve for each program. They are located where there is the most traffic and where nothing else will detract attention from them.

We have had a very interesting experience with these posters. Originally, we used them to stimulate suggestions from the members of management, which as we have indicated previously, includes foremen, supervisory and technical personnel. Naturally, we were interested in finding out just how effective this part of our program was, and we compiled some statistics concerning

the number of suggestions received per one hundred employes and the posters issued. (See Chart No. 4.)

We found that there was a downward trend in 1938 suggestions from February through October and November. There was, however, an upward trend in December. We feel that this was a desire on the part of the wageroll employe to secure some additional money at Christmas time by submitting suggestions. There was the same general trend existing although the quantity of suggestions was higher during 1941. Now here is a point which we feel is very significant. During the month in which no posters were issued, there was a definite trend toward no suggestions from the members of management.

During all of our previous campaigns, we have been under the impression that posters acted as a windfall in affecting and influencing the number of suggestions that we received from the wageroll employes, even though our original purpose was to promote suggestions with the members of management primarily. Here is rather conclusive evidence that our original intent of the posters has been fulfilled and they are accomplishing the purpose for which they were originally established.

In the first program that we conducted, we issued a Methods Research Bulletin which was prepared on "ditto" paper. We received considerable criticism of this amateurish method. As a result of this, in 1940, we resorted to a printed publicity medium, and brought to our department the services of an individual who was capable of doing work of this type not only for our Methods Research Program but for all of the other publicity activities throughout the plant. (See Chart No. 3.)

We have found that management appreciates the professional touch. It is a much nicer medium for them to show their wives what they have done at the plant. And speaking of their wives, we show the number of suggestions that were placed in effect, the name of the suggestor, the value of the suggestion, and a short description of the suggestion. We have used charts showing the percentage accomplishment of the different areas against the budgets they established for themselves. We have analyzed our results and from them have drawn up another series of charts for analyzing the past programs very carefully to determine our plans for the future in a more intelligent manner. (See Chart No. 11.)

If there is the slightest error or if someone feels he has a prior right to an idea, we are called immediately. Frankly, four years ago, we didn't believe in such a plan. We were of the opinion that there had to be a direct financial incentive. And today, we believe that is true for hourly employes, but as a rule, management employes are more interested in bringing their accomplishments to the attention of everyone. They know they will benefit more in the long run than if they receive a direct financial reward.

At the conclusion of each campaign, we make a tabulation of the number of suggestions and their value which have been submitted by each management employe. This is turned over to our Works Manager who is charged with the salary administration of the plant. I know he takes this listing into account when he periodically reviews the rates of the various salaried employes.

In passing, I might say that all suggestions submitted by hourly employes are subsequently passed over to the regular Suggestion Committee of the plant for evaluation and award. In such instances, a report from the Methods Research Program Co-ordinator accompanies the suggestion.

In talking with different people concerning a Cost Reduction Program, one thing seemed to catch their interest as a major part of our program. We have endeavored to stress the point that this work cannot be done by the staff organization—it isn't a specialist's job. It is the everyday responsibility of each member of management. We want every foreman to share in the total responsibility of his area or department. To this end we employ a chart system.

In each area superintendent's office we have a chart which shows the per cent accomplishment of each subgroup such as supervisors or technicians. Pictographs show the progress of the various supervisors who report to the area superintendent.

Of course, there should always be a master control chart somewhere, and we keep that one in the Works Manager's office. This shows the per cent accomplishment of each superintendent's area, and also the combined plant performance.

It is important to keep in mind that all of the budgets of savings that are established are arrived at by the persons themselves. And contrary to the generally accepted thought, they do not set easy budgets for themselves. They appreciate the seriousness of the program, and everyone not only takes part but really tries to do his best.

In older operations, where definite budgets of cost have been established and stabilized, suggestions are calculated on the basis of the reduction in cost below the current year's cost budget. These suggestions are called

"Conservation" suggestions, and they form the majority of the savings made.

During the past seven years, our plant has been passing through some major changes. New plastics have been introduced. This created a problem, for as you know, new processes or methods are not as efficient at the start as they are forecasted to be or eventually become. For example, the forecasted yield in an operation might be 90 per cent, but when you begin production it might be only 70 per cent; and, it usually involves a struggle to get up to the proper operating level. When suggestions are submitted, which act to help approach this 90 per cent point, we call them "Process Improvement" suggestions. Sometimes they involve large amounts of money which would dwarf the work done in older operations. That is why we separate them. (See Chart No. 9.)

In the past two years, we have started each year's program with a dinner meeting for the entire management group. This consists of upwards of two hundred persons. On these occasions, we endeavored to rebuild the spirit and enthusiasm of everyone to go out and try to beat the previous year's record. This has been done successfully because immediately after such meetings, we get a real burst of suggestions and activity. Also, at these meetings, we have tried to present each person with something that had intrinsic value and which would be a symbol of renewed effort for the oncoming program.

Back in 1938, when we were conducting our first waste elimination program, we held a series of meetings on the fundamentals of motion economy. We noticed that the men did not take very extensive notes, and it was our feeling that some of the information should be available for instant use. Accordingly, when we began our 1940 program, we felt it advisable to consolidate some of these basic principles into a handy reference manual, so that the men could make use of the various fundamental principles in analyzing the work that was going on from day to day. In 1941, when we started our third annual program, we felt that this handbook should be continued. However, it was our belief that it could be prepared in a form which would make it more useful. This was the reason for combining it with a memorandum pad, so that it would be on the person of each supervisory and technical employe at all times. (See Chart No. 5.) We have received very favorable comments from our men in regard to this pocket secretary handbook. We know they are using them by the number of requests we received for refills of the note pad. We shall develop something of a similar nature for our 1942 program.

It seems that there is always a "Doubting Thomas" in every group. That is a good thing too for it helps to keep us all on an even keel. Far be it from us to make unsupportable claims, but we say to anyone in our organization that the records can be opened for inspection and audit at any time. Every suggestion received since we started is still on file and can be obtained at a moment's notice. A folder gives the complete history including all the savings calculations. Now whether we save money for the company or not, can be determined by the cost records.

Under the stress of production in this war period, industry seems to be going about its day-to-day tasks in a more orderly manner. There is evidence of more rational thinking and less of the hysteria of production regardless of cost as occurred in World War No. 1. When prices must remain the same, regardless of manufacturing cost, even though it may be increasing beyond the economic point, there is no alternative but to turn to savings for the answer. When our equipment and machines are turning to capacity and additional machine tools are not available, the only answer is to make them more efficient. (See Chart No. 8.) Therefore, those companies and organizations engaged in this work throughout industry are contributing their share, and I might say in some cases even more than their share to the task that is ahead of all of us as the "Arsenal of Democracy."

It is only through the close co-operation of every member of the supervisory organization that such a program can succeed. That is why we say our Methods Research Program is a management function including every foreman in our plant.

Standardization—Harmonizer of Human Effort[1]

By DOUGLAS F. MINER

George Westinghouse Professor of Engineering, Carnegie Institute of Technology

THE day is past when standardization has to be sold to business executives. At one time the mention of this subject brought forth visions of governmental regimentation, of drab products without sales appeal, of inflexibility of personal action and a closing of minds to new ideas. But now we accept standards wherever useful as a saver of time, expense or human effort. Without at least temporary stabilization, we would have little opportunity for progress.

We meet standards every day in the home, in the street, in the factory, in the arts. Personal habits are essentially standards of behavior which conserve our mental and physical energies. If we had to think out each step of the morning shaving or dressing operations, we would miss the train. If we put conscious effort into the motion of walking or had to think out how to dictate the address on a letter each time, life would indeed be a burden. And in the field of art, certain techniques of painting, or of playing musical instruments or singing become sufficiently automatic so that the artist can give full attention to expression of an inspiration rather than becoming distracted by the mechanical operations involved. Dr. John Gaillard of the American Standards Association describes a standardized procedure in music. The successful performance of a symphony orchestra, he states, depends on several standards, the standard of pitch, the time values of notes, and the standard marks of expression. These do not seem to hinder the conductor in his individual interpretation of the music.

Technical Standards

Without technical standards, modern manufacturing would be impossible. It is obvious that large scale, low cost production depends on the development of suitable standards. We have become entirely familiar with and recognize the value of uniformity in countless elements of industrial procedure.

Materials. For example, standardization of materials has simplified manufacture and reduced costs. Here are some typical Westinghouse cases. In one year, the reduction in varieties of insulating textiles and the use of standard market grades produced a saving of $100,000. Careful examination of the needs for electric cables disclosed the possibility of reducing the number of varieties (voltage ratings, materials, stranding, covering) from 270 to 67. From years of experience in materials standardization, certain fundamental rules were developed and furnished to design engineers. The more important rules are:

In general, material standards must be governed by design requirements and economics. This requires:

1. Sufficient variety (grades) and sizes available to accomplish the engineering result.
2. Avoiding too many grades and sizes because this increases costs (purchasing, stores, obsolete stocks, records) and leads to confusion and multiplicity of records.
3. Avoiding too few grades and sizes because this frequently leads to the use of too expensive grades (when intermediate quality is not made available) and too large a size (when intermediate size is not made available).
4. Rational selection of grades and sizes to provide sufficient range of quality and quantity in economical steps, avoiding of grades or sizes too close together. Make use of preferred numbers.
5. Standards selected in line with national or trade practice to provide minimum cost and maximum availability.
6. Standards co-ordinated between plants to provide for exchange of stocks or to prevent trouble in moving activity from one plant to another.
7. Adequate information furnished to all departments on standard materials.

Parts. Interchangeable pieces such as hardware have offered a fertile field for uniformity of practice. In a large company it is surprising how much useless diversification can creep in if no continuous effort is made to hold individuality in check. Metal washers might seem to be sufficiently simple to discourage growth of "specials." Ambitious designers can think up an almost infinite array of thin washers, thick washers, big washers with little holes and little washers with big holes. At one time a study I had made revealed 1350 sizes of

[1] Paper presented at the Annual Conference of The Society for the Advancement of Management, December 5, 1941.

metal washers. We found we could get along with 150.

This result stimulated a general study of all commonly used hardware parts and the list of over 14,000 items was cut to 7,000.

Design. Another commonly accepted function of technical standardization is in products or parts of products. It might seem that a turbine generator or motor for driving a rolling mill would not offer much opportunity for standardization, whereas attachment plugs or lamp bulbs might be easy. Design practice has, however, made great progress in developing standard elements even for large machines. For example, the same frame, bearings, brush auxiliaries, or end brackets can be used in many related sizes or varieties of machines. One of the earliest schemes in adaptation of motor designs to many uses was to design frames and end brackets that would suit floor, wall or ceiling mounting of the motor.

Manufacture. Countless illustrations of the profitable use of standard methods of fabrication and processing can be cited. Jigs and fixtures for rapid and accurate duplication of parts, conveyer systems and planned flow of operating units are common features involving a degree of standardization. Time and motion study are other standardizing tools by which maximum economy of human effort is obtained. As illustrated in a recent number of *Life,* the rate of assembly of small parts can be doubled with no added mental effort by proper arrangement of facilities. Standard preferred sequences of operations can also be useful. It was found that in machining several locations on a large casting, a new sequence of layout and machining operations eliminated many steps involving locating centers and surfaces of reference.

Office Methods. In the field of clerical systems which furnish the records necessary in a business, standardization has worked wonders. "Paper work" has been simplified, has reduced the manual labor of keeping records and performing accounting operations. Tabulating and calculating machines are illustrations of the mechanical aids involved in standardization of office procedure. Accuracy and speed are essential in keeping a finger on the pulse of industry by supplying management with the facts required.

Human Standards

Since principles of standardization are so useful in the technical side of industry, what can be said for the human side? What standardization is possible and of what benefit in the field of personnel administration? The technical types of standardization described have a bearing on human problems in that they help conserve effort. Tasks become simpler, more direct. The supervision required is reduced because standard procedure has been decided upon. However, these effects are indirect. We are accustomed to think that people are so unpredictable that uniform practices are out of the question. The application of scientific methods to social problems is looked upon with some degree of skepticism. We have noted, however, that people have a uniformity of habit and their actions follow a pattern which can be plotted if we have enough facts. Measurement of physical things has been a useful intellectual tool of civilization; measurement of human values is now rapidly developing and becoming useful in solving problems of management. No one profession or field of learning can claim all the credit for the progress made. Psychologists, social economists, engineers, industrial relations specialists and others have all contributed. Let us examine some of the activities primarily concerned with administration of personnel where standards have been developed and applied with notable success. I have selected as illustrations the standard systems developed by the Westinghouse Electric and Manufacturing Company in (a) job rating and grading of production workers, (b) position rating for office workers, (c) performance rating of office workers.

Job Rating and Selection of Workers

There are three parts to the problem of fitting the right man to the right job in the factory: job analysis, selecting (or training) the worker and paying a just wage. The first is an adequate job analysis. The characteristics of the various jobs involved in a given industrial unit must be ascertained, listed and evaluated. Successful production of goods by processes found to be best requires certain operations or types of work. The qualifications of a suitable worker for each may be different. Operation of a punch press, for example, could not best be done by a worker trained to use carpenter's tools, or by one not able to read or by a man crippled by infantile paralysis. There are inherently certain factors of training or experience, of education and of physique that go with the job. From the management angle rather than the social, therefore, our first task is to know in detail what nature of jobs we have in the manufacture of a product. We would not expect to find coil winding jobs in a foundry. Not that we

ignore the social responsibility or the human elements. Those are discussed later.

Ten component criteria of personal qualifications have been selected, each assigned a range of "point rating," as follows:

Item	*Qualification*	*Point Range*	*Symbol*
1.	Basic Education	0-100	B
2.	Experience required	0-100	E
3.	Aptitude required	0-125	A
4.	Physical application demand	0-40	P
5.	Mental application demand	0-40	M
6.	Visual application demand	0-40	V
7.	Unusual demand	0-20	U
8.	Responsibility for equipment	0-25	Eq
9.	Responsibility for product	0-25	Pr
10.	Responsibility for safety of others	0-25	S

This means that, for example, the difference between the maximum experience required (Item 2) and the minimum covers 100 points and a job that can be performed by a man of moderate experience might carry a point rating of 50 for this qualification. The point rating for each of the 10 qualities is estimated and the total added to give a figure known as job points. For example, an unskilled labor job may have a job point rating of 52 and a highly skilled tool maker job might be rated at 300 or higher. Since the work of each plant is somewhat different, it is inadvisable to rate like-named jobs equally for all locations. The skill required for a drill press operation in one plant may be higher or lower than the same operation in another part of the organization. To serve as a guide toward just and uniform practices, certain commonly understood jobs are given ratings known as "anchor point" ratings. Local cases are compared to these standards and adjusted up or down as seems justified. The anchor point jobs are classified into Service Occupations (41 examples), Productive Occupations (68 examples), Inspection and Testing Positions (8 examples). Using these as a manual, any other specific job can be readily worked out. A few examples of anchor point ratings will show the principles involved. It is to be noted that part of the specification of a job is an adequate description.

1. *Service Job. Pipe Fitter, Grade A.* Lay out and install high pressure steam pipe (50 lbs. or over), or power house piping, refrigeration piping, accumulators, install pressure regulators and other controls. Work without direct supervision.

B* = 60, E = 80, A = 10, P = 25, M = 20, V = 5, U = 15, Eq = 5, Pr = 15, S = 0. Total, 245 job points.

* See Symbols in previous table.

2. *Production Job. Painter, Grade B.* Ordinary brush or spray operations on large apparatus, cabinets, machine tools, motors, etc. Requires skill in applying lacquer.

B = 25, E = 30, A = 0, P = 20, M = 5, V = 10, U = 5, Eq = 0, Pr = 5, S = 0. Total, 100 job points.

3. *Inspection Job. Tester, Grade A.* Conduct experimental development and commercial tests on all types of complicated apparatus from engineering test specifications. Must be familiar with all types of electrical measuring devices, electrical circuits and test floor equipment. Make own test setups. High degree of responsibility for decisions on quality and performance.

B = 100, E = 60, P = 10, M = 35, V = 10, U = 20, Eq = 15, Pr = 25, S = 15. Total, 300 job points.

The second step is the selection of employes. In filling specific jobs, selection can be made from employes already working or by hiring new employes. In the first case, reference to service records and personal knowledge of supervisors will lead to satisfactory judgment in most cases. Hiring new people successfully is helped by thorough inquiry into past training and experience and a checking of previous employers to establish personality traits. There is no sure formula but a sort of intuitive sense is often developed by employment interviewers.

An essential auxiliary of any system of selection in a large organization is a definite program of training, especially for younger employes. By such a program both employe and employer are benefited. The Westinghouse program provides training of several types, covering factory positions which we are now considering, and office or salaried positions as well. The courses offered under company supervision are listed here:

1. Trades training
2. Manufacturing methods engineering
3. Junior drafting
4. Stenographic training
5. College graduate training
6. Executive development

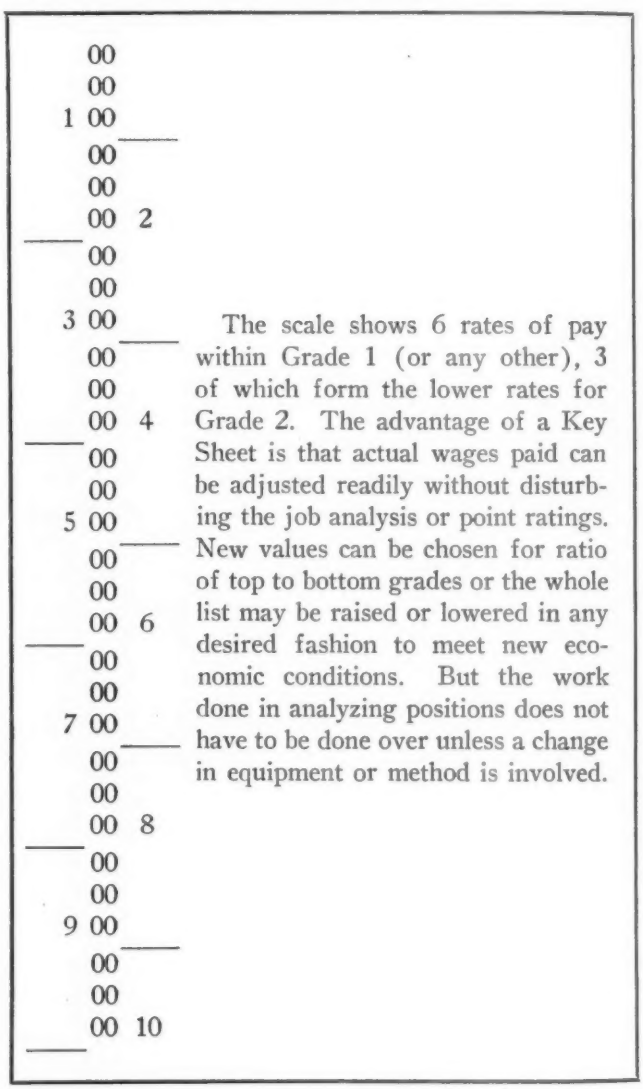
There are many other agencies which the company encourages employes to make use of, such as night schools of high school and college grade, correspondence courses and, more recently, "Defense" courses.

Considering again the three elements of factory personnel administration, the third is the establishment of equitable rates of compensation. The first step is determination of a scale of "labor grading." It has been found convenient to divide the range between the highest and lowest paid jobs into ten grades or classes. To

provide proper differentiation, a percentage relation should exist between successive grades, 25% being an acceptable increment, where the total range between top and bottom is sufficient. The labor grade number is directly related to the above-mentioned job point rating. For example, ten classes or grades with 25% increments can be formed as follows:

Labor grade	*Job point rating*
1	300-up
2	240-299
3	193-239
4	155-192
5	124-154
6	99-123
7	79-98
8	63-78
9	50-62
10	up to 49

Referring to the jobs used for illustration, the pipe fitter job would be in Labor Grade 2, the painter job in Grade 6, and the tester in Grade 1. The next operation is making of a Key Sheet or Key Card for the plant or division involved. Definite brackets of hourly rates are thereby determined for the various labor grades from 1 to 10. A ratio is selected between the two ends of the scale, corresponding to the comparison of proper rates for the most skilled and least skilled job. Unless community standards would be violently disturbed, it is advisable to have this ratio as high as possible, for then a high incentive is provided for employes to attain the higher grade jobs either through experience or formal training. Encouragement of "upgrading" insures against excessive labor turnover. The rates paid for the ten grades successively overlap so that flexibility is provided to cover learners and experienced, efficient workers. Graphically the scheme may be shown as opposite.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The scale shows 6 rates of pay within Grade 1 (or any other), 3 of which form the lower rates for Grade 2. The advantage of a Key Sheet is that actual wages paid can be adjusted readily without disturbing the job analysis or point ratings. New values can be chosen for ratio of top to bottom grades or the whole list may be raised or lowered in any desired fashion to meet new economic conditions. But the work done in analyzing positions does not have to be done over unless a change in equipment or method is involved.

Salaried Position Ratings

Standardization is being applied to so-called "office workers." Usually we think of salaried employes as "brain" workers doing a minimum of physical work. But this is not an adequate distinction, since many wage-paid jobs involve much higher level of mental activity than some clerical jobs. A statement of policy on this point eliminates misunderstanding. The salary method of payment (as defined for Westinghouse employes) is applied to those who manage, supervise, plan, provide for or service the production workers, or engage in general duties of sales or administration.

The principles of job analysis might seem difficult to apply to office workers, particularly to creative work. The problem is different, to be sure, but lends itself to satisfactory solution. A pioneer in this field, Dr. E. B. Roberts, Assistant to the Vice President of Industrial Relations, has developed guiding principles and a workable system which have been successfully applied throughout the Westinghouse organization and have been tested in other companies as well.

Westinghouse salaried positions are divided into seven groups of increasing responsibility. Here again the aim is first to define the essential positions and then place the individuals where they fit best. Each position

has a range or bracket of allowable salary. For a man to merit a salary beyond the range in a given position involves exhibiting aptitudes for a higher classification. Except for limited flexibility, the salary goes with the position rather than with the individual.

The groups and group functions are:

I. *Unskilled.* The positions of this group, mostly clerical in character, require accuracy and dependability, but no extended training. Office boy, record clerk, and file clerk.

II. *Skilled.* The positions of this group, mostly clerical in character, require, in addition, training of hand or mind. The group includes such positions as stenographer, production clerk, detail draftsman, and ledgerman. Among the non-clerical positions of this group are laboratory assistant, power plant operator, and demonstrator.

III. *Interpretative.* The positions of this group call for ability to classify work and apply established procedures toward its accomplishment. Many of the positions are clerical, such as correspondents; but others are non-clerical, such as foremen, laboratory technicians and layout draftsmen.

In most positions of this group the work is non-supervisory in character, but in the highest positions of the group the work is supervisory and involves little or no substantial amount of work of the same kind as that done by those supervised. Illustrations are: chief clerk, office manager, foreman.

IV. *Creative.* The positions of this group are those of creative character such as engineer, salesman, staff supervisor, attorney, system designer, and working group leader and section supervisor within these fields of activity.

V. *Executive.* The positions of this group are those of Department Manager, Local Sales Manager, Superintendent, General Foreman, and the Assistant Managers and Superintendents of large departments. The function is that of departmental management in the broad sense.

VI. *Administrative.* The positions of this group involve responsibilities of large magnitude or over-all character or for mixed functional divisions, such as Division Manager, District Sales Manager; of high order functional character, such as Accounting Director, Chief or Consulting Engineer, Director of Research, Treasurer, General Manager of Purchases & Traffic, and General Works Manager.

VII. *Policy.* The positions of this group are those of the senior, elected policy officers of the Company.

It is essential to have uniformity in the designation of positions, particularly in the higher groups. Titles should mean the same in all plants or divisions. Definitions and rules have therefore been set down clarifying such titles and names as director, manager, superintendent, supervisor, division, department, section. For example:

Department: Applies to a closely knit, self-contained activity devoted to a specific function, presided over by a Manager, as:

Patent Department
Industry Engineering Department
Service Department
Industrial Sales Department
Mechanics Department, Research Laboratories

or a major activity of an operating division, as:

Stoker Department, Steam Division
Porcelain Department, Switchgear Division
Engineering Department, Small Motor Division

In the Salary Employment Manual furnished to executives, nearly 500 named positions are described, classified and arranged in the seven major groups. Many of these, while having different names (e.g. Assistant Division Sales Manager and Assistant Industry Sales Manager) are equivalent in worth and are put under the same class number. This combining of similar jobs gives about 300 different classes of positions in the seven main groups. Each major type of activity with the company has its own named positions with a designating symbol. These segregations are:

Activity	*Number of positions defined*	*Symbol*
Clerical	86	C
Accounting	14	A
Advertising	5	Ad
Engineering	25	E
Publicity	5	Pb
Industrial Relations	19	I
Law and Patent	12	L
Sales	37	Sa
Service	12	Se
Manufacturing	36	W
Treasury	9	T
Purchases and Traffic	7	PT
Radio	16	R

Example descriptions of positions are selected from sales, clerical and manufacturing activities:

Salesman (4-Sa-4)[2] The duty is to secure profitable

[2] The first figure designates group IV (creative), the letters = sales, the last figure, the fourth sales position defined.

orders for the products of the Company from a prescribed list of customers with profit to the Company, and satisfaction to the customer with his continuing and increasing acceptance of the Company and its products. Essential to the adequate discharge of this responsibility are effective use of a knowledge of the products, knowledge of the customer's business and organization, knowledge of competitive products and activities, knowledge of credit standing of customers, adequacy of commercial service rendered, maintenance of prices, care in clerical work involved, economy in expenditures, as well as effective use of a knowledge of the art and practice of successful personal relationships and salesmanship. The Salesman is responsible for creative thinking directed toward the uncovering of new business, and in the study of, and report upon, business lost. He is responsible for reflecting back through the organization needs for the development of new products, or re-design of old lines.

Record Clerk (1-C-7) Maintain master or index records of style numbers, style cards, sub-files, insurance cards, orders, requisitions, invoices, debits, journals, correspondence, negotiations, etc.

Issue number designations in accordance with instructions

Review records for correctness

File

Works Manager (6-W-2) The responsibility is for the profitable management of a Works. The discharge of this responsibility calls for a broad comprehension of the products with which engaged, the materials used, tools, the nature of the processes, the technical standards to be met, and the field conditions under which the products are applied. The Works Manager is responsible for the tone and character of the manufacturing organization, as reflected in its profit and loss statements, the adequacy of the service rendered by it, the harmony of its domestic relations, as well as its relations with the parallel functional organizations of Sales, Engineering, Accounting, Service, etc. These responsibilities are discharged through an effective leadership of Superintendents, and Works Manager's Staff Supervisors.

Rating of Office and Supervisory Employes

In discussing position analysis, we have been concerned with defining and delineating the job itself, not with the employe who is to fit the position. Measurement of work is possible in relative, if not absolute, terms and presents much less difficulty than measurement of the worker. In the field of employe rating, no perfect standards of measurement are available, and the task changes from an objective to a subjective one. Performance of an individual may be satisfactory for one position but not for another; the work done by the office boy cannot be rated in the same terms as that of the vice president.

Some systems of rating have listed qualities or characteristics and a rating on each is supposed to add up to a score indicative of the individual's worth. By qualities, we do not mean such traits of character as honesty, integrity or sobriety. These are assumed to be essential to success in any position. The qualities usually chosen for a "high," "good" or "poor" grading include such terms as co-operativeness, loyalty, dependability, initiative, aggressiveness, punctuality, efficiency, accuracy. The hope is that a careful rating on each of these "properties" will give the answer. Results for such a method are usually disappointing and no two people agree on ratings. A modification, sometimes used, is the comparison of people with respect to a given characteristic. Several persons are to be rated relative to each other on "aggressiveness" for example. Or a known individual is used by all raters as a standard. Others are judged better or worse than he.

The important fact to be ascertained is how well an employe does his work and how qualified to undertake a higher grade. In other words, performance, not attributes, is what we seek to measure. We want to treat the man as a whole and not an assembly of component parts. Emphasis on the separate elements may be possible where definite tasks are to be performed but are of little use where responsibility is a major requirement. As we go up the scale of positions, we progress from *tasks* to *duties* to *responsibilities*. These three cannot be measured by the same yardstick. An employe who is perfect in performing tasks may be wholly unsuited to assume responsibilities in the management sense.

Instead of searching for a point rating of individuals in certain attributes, the Westinghouse system seeks the answers to questions about how the employe does his job. A list of questions has been prepared covering the seven groups of skills, graded according to the position involved. At the lower end the questions are simple such as "Is he on hand when needed?" applicable to a messenger. This is in the region of *tasks*. In the *duty* bracket of positions we ask pointedly, "Is he versed in the technique of his field?" When we proceed to the *responsibility* group, we find such questions as "Has he a vision of achievement?"

WESTINGHOUSE RATING SCALE

Unskilled
Office Boy
Messenger
Record Clerk
File Clerk
Dept. Machines Operator

Interpretative
Cost Clerk
Secretary
Product Demonstrator
Layout Draftsman
Lab. Supervisor
Order Correspondent
Chief Clerk
Office Manager
Sales Assistant
Price Clerk
Foreman
T & M Analyst

Executive
Works or Dist. Auditor
Adv. Manager
Eng. Managers
Patent Manager
Hdqtrs. Dept. Asst. Sales Mgr.
Dist. Industry Manager
Local Territorial Sales Mgr.
Local Manager
Dist. Serv. Mgr.
Works Supt.
General Foreman

Is he on hand when needed?
Does he understand instructions and retain them?
Does he do his work with accuracy and dependability?
Are his movements efficient?
Is he skilled in his occupation?
Does he require constant supervision?
Does he respect confidence?
Does he classify his work accurately?
Does he set a good example in conduct, appearance and attitude?
Does he recognize what is beyond his scope?
Does he refrain from assuming too much authority?
Does he carry through?
Does he recognize conditions that need improving?
Does he secure cordial response from those under his authority?
Is he versed in the technique of his field?
Is he original?
Does he assemble facts, select essentials and reach decisions?
Does he accept leadership in the field of his work?
Does he express opinion without apology?
Does he show an instructive attitude toward those under him?
Does he set a tempo for his own work and the workers under his charge?
Does he recognize the difference between fact and surmise?
How does he take his mistakes?
Is he constantly searching for improvements and economies?
Does he carry out plans?
Does he plan ahead?
Is he able to interpret meaning and intent and apply general instructions? (not bound by literal-mindedness)
Does he delegate wisely, making clear-cut assignments?
Does he keep his head?
Does he give others full credit for their accomplishments?
Is he consistent in his dealings?
Does he take a determined stand on important matters?
Does he develop harmonious, co-operative relations?
How does he react to criticism?
Can he co-ordinate?
Does he do first the things of most worth?
Has he humor and perspective?
Can he yield graciously in compromise?
Do his judgments inspire confidence?

Skilled
Time Clerk
Stenographer
Tracer
M-I Clerk
Detail Draftsman
Lab. Assistant
Pwr. Plant Engr.
Ledgerman
Production Clerk
Sec'y.-Steno.

Creative
Copy Writers
Acctg. Section Supervisors
Engineer-Design-Research
Attorney at Law
Patent Attorney
Salesman
Headquarters Sec. Sales Supervisor
Field Service Engr.
Credit Correspondent
Collection Correspondent
Manager Engineering

Administrative
Acctg. Director
Asst. to Vice Pres.
Chief Engineer
Dir. of Research
General Attorney
District Manager
Hdqtrs. Dept. Sales Manager
Treasurer
Credit Manager
Gen. Works Manager

	Can he negotiate differences and arbitrate clashes?
	Can he foresee conflict and minimize its damage?
	Has he a vision of achievement?
Policy	Has he great ideals?
Vice President	Has he the gleam to vitalize them?
Sec'y. of the Company Comptroller President Chairman	Is he capable of thinking and action on the plane of industrial statesmanship?
	Does he exhibit that well-integrated personality that gives others confidence in him?
	Has he inner resources of vast physical and mental energy and endurance?
	Has he courage in defeat?

The use of such a set of questions is simple. The rater asks himself each of the half dozen questions about an individual of a certain class or group and marks + if superior, a check mark if nothing to note, and − if inferior in performance. These marks are not totalled but are easy to compare with similar marks made for other individuals doing similar work or considered for the same position.

This system transfers emphasis from qualities to actions and is based on the belief that expression or evidence of worth appears in right action on the job. We measure ends and results rather than means and methods.

These illustrations of Westinghouse standardization applied to jobs and people that fill them are evidences of a plan to conserve, co-ordinate and harmonize human effort. These examples are only a few of many. It is appreciated that conflicts are avoided if duties and privileges are well defined. Each employe wants to feel sure just what his job includes and to whom he is responsible. Indefiniteness of instructions leads to dissatisfaction, controversy and a feeling of insecurity. For several important functions, therefore, detailed instructions, procedure and rules have been drawn up. Among these might be mentioned the Sales Manual, the Accounting Manual, the Shop Rule book and the Office System Manual.

NOTE

The Brookings Institution is experimenting with the rather novel procedure of presenting a serious book for the management audience in the form of a series of pamphlets. The first of these has just come out and if it sets the tone and value of the rest, presages a work of exceptional merit. The entire book will be called *Price-Making in a Democracy* and the first pamphlet comprises chapter one—"Between Automatic and Authoritarian Price-Making." The author is Edwin G. Nourse, Director of the Institute of Economics of the Brookings Institution. The individual pamphlets will be available at $.25 each.

Expediting Deliveries Through Production Control[1]

By M. G. DEMOUGEOT

Assistant Production Manager, Eclipse Aviation Division of the Bendix Corporation

TODAY we must deliver maximum quantities of products in a minimum of time. In order to do this, we must have production control; the objective is efficient manufacturing. In other words, have the right material in the right place at the right time.

Production control in the broad sense is the same for most industries, but the elements and methods used to expedite deliveries will vary according to type of product.

In our present discussion, we speak of a plant producing a considerable number of different products with repetitive quantities of precision parts varying from a few hundred to a few thousand of each type unit per month. This type of production requirement, perhaps, presents more difficulty in controlling deliveries than a plant producing, for instance, a few large printing presses per month, because a great many parts must be started through the shop at weekly intervals and kept moving each and every day in order to assemble a given number of units per day.

Production control starts with a sales forecast, showing quantities per month of each type of unit. In normal times, the forecast shows requirements three months ahead, plus reserve (the reserve column indicates total units on order beyond the scheduled months shown). Under present conditions, the sales forecast shows a full twelve-month's requirements, plus reserve. Standard units which are sure to repeat indefinitely are marked with an asterisk. This forecast is our basis for ordering materials, equipment and tools. On all units we order for twelve months, plus reserve, and on items with the asterisk we order one third more. Machine capacities are checked almost monthly to insure our having sufficient equipment on order.

As soon as the forecast is released, it is turned over to the International Business Machines Group and a complete analysis of parts requirements for all models made. The tabulated list is compared with the individual parts status cards by the planning supervisors to determine whether additional orders should be issued to the shop and vendors. At this point, judgment has to be exercised as to how far ahead certain parts should be ordered.

As each part requiring reorder appears, the planning supervisor makes a penciled note on the IBM list showing the quantity and month required. The list when completed is turned over to clerks who issue purchase requisitions and route cards on indicated items. Purchase requisitions are sent through to the purchasing department and copies turned over to the planning purchase expediting group for follow up.

Route cards and raw material requisitions are turned over to rough stores where bar stock, castings, etc., are laid out to match quantities called for on cards and then sent out to the department in the shop where the first operation is to be performed.

Each and every productive department in the plant has its own dispatch area, inspection group, counters and time clerks; each product has its stockchaser or expediter and each three departments have their stockchaser supervisor, whose major function is to see to it that equal consideration is given each product and to judge important issues. Each incoming job has its route card showing quantity and month in which the particular lot is to be completed. The dispatch clerk arranges the racks and pans in proper sequence in the dispatch crib. The time clerk in his spare time, makes out productive labor tickets in triplicate and also what is termed a job control card. The control card, in addition to usual part number, name, etc., shows the quantity assigned to each operator; the quantity finished and scrapped and has a column showing cumulative totals.

The stockchasers, in collaboration with the departmental foreman, determine preferred jobs each morning. Items selected are turned over to the counters (approximately thirty machines assigned to each counter) whose duty it is to locate the items and line them up in one section of the area during the day for the night shift. The same procedure is repeated at night for the day shift. Each counter must have all his machines loaded at least thirty minutes before the change of shift, and then move the material to each machine in time for the operator to start on the next shift. The counter then checks into inspection the work from preceding shift

[1] Paper presented at the Annual Conference of The Society for the Advancement of Management, December 4, 1941.

and marks up quantities on control cards, thus the night inspection crew checks the work done during the day and the day inspectors check the work done at night.

The timekeepers' function is to punch in and out the productive labor tickets and machine efficiency cards. (The dispatch clerks report to the planning department, the counters and timekeeper report to the accounting department and the inspectors report to engineering.)

After each lot of parts is completed, inspected, and the proper entries made on control cards, labor tickets and route cards, and the paper work distributed; the work, together with the route card is passed on to the next dispatch area and the process repeated.

Upon completion of all operations, the parts are passed through Army or Navy inspection and if approved, a "deliver to stock" ticket is made out in duplicate, one copy going to production control and one copy to stores, with the parts. After the parts are placed in the store room, the duplicate ticket is sent to production control and matched with the original copy for verification.

We have thus far been working on a *general* production plan. We now get down specifically to the next month's shipping requirements. A meeting is held in the evening, approximately the twelfth of each month. A sales department executive, two or three production planning executives and a stores layout comptroller are present. The sales executive has prepared a tentative schedule showing the quantity of each type of unit desired or required for customers' needs. The stores department has successively laid out the physically predetermined quantities of parts for each type of standard unit. They may have as many as five or six quantity layouts ahead of assembly on each type unit, all serially numbered to match the assembly schedules, together with a shortage list of parts missing from each layout.

The sales executive now states he wants a certain quantity of the first item on his list. The planning supervisor compares this quantity with the previous month's schedule to see if there is any material change in volume which will affect the type of labor, assembly facilities, test equipment, etc. If the quantity specified looks reasonable, he then asks the layout comptroller for the layout number from which the quantity specified is to be drawn and looks over the shortage list on this "layout" as well as shortages on previous layouts. From a knowledge of the parts, time elements required to produce them, etc., he can judge whether or not the schedule can be met. We then move on the next unit required and repeat the process, until the entire schedule has been gone over. Meantime, one of the production supervisors has been jotting down highlights, such as, increases in given models, decreases in others, shortages of major parts, etc.

These notes are now examined by the production supervisors to determine the collective effects in the shop and the schedule is then accepted, or modifications are requested from the sales department. The schedule is now printed and issued to all interested parties.

The shortage lists on respective units are turned over to the stockchaser supervisor who holds a daily meeting of all stockchasers at 7:45 A.M. and asks the status of all parts short, both purchase and shop parts. At the end of this meeting, a so-called "hot list" is established for each productive department in the shop and for each vendor of purchased parts.

"The physician who closes his books the day he is graduated from medical college, and then never again has occasion to learn of the many new discoveries being made in the field of medicine, is no more derelict to his profession than the business executive who does not expose himself to the new knowledge that is being accumulated in the many different fields of industrial relations, marketing, public relations, and organization," says Thomas R. Jones, President of the American Type Founders Corporation.[1]

[1] Abstracted from *Net Results*, H. A. Hopf & Company, New York.

Progress in Controlling Production[1]

By JOHN A. WILLARD

Partner, Bigelow, Kent, Willard & Company

THERE are many of the techniques involved in scientific management, which while extremely valuable to top management, are by no means mandatory.

For instance, a business can be run without a budget. Again, a business can be run on hourly rates of pay with no measures of how much labor value is returned to an employer. Any business, however, which progresses much beyond the one-man stage must take cognizance of some kind of production control. Therefore, some of the more fundamental principles underlying production control are probably better understood by the average business man than either budgetary control or wage incentives.

For instance, we will suppose that Jim Smith starts a small business. He handles all his orders, buys the materials, fabricates the gadgets and does the shipping and collecting. As business picks up, he gets a piece of paper or a "day" book and writes down the orders one after the other as they are received. Quite often in the old days he used to bill right from the same day book. This meant that Jim Smith started out by making his gadgets and filling his orders pretty much in the sequence that they occurred in his day book until one day a friend came in a big hurry and said,

"Jim, I'm in a fix. Can't you let me have these gadgets a few days in advance? Can't I have them now?"

Jim said, "No, I can't and you can't because Joe Bailey wants his order."

You can make your own guess as to whether Joe Bailey is put behind the 8-ball or whether the friend gets the preference.

But right there production control begins to be understood by Jim Smith. It also begins to be understood by Joe Bailey when he finds out what happened to his gadgets which were not delivered on time.

This extremely simple combination of human nature and manufacturing control, has resulted in the development of a tremendous number of rough and ready plans, many of them downright clever, for the handling of orders in the office; for putting these orders through the shop, and for keeping everybody satisfied.

Looking back into industrial history, we become aware that one of the first uses for power was made in driving spinning frames and looms, so that our textile businesses were among the first to encounter the necessity for some type of production control. As a matter of fact, with advanced forecasts of styles, with records of under- and over-sold position on different styles of goods, and loom schedules, the textile industry developed out of its own needs types of production control which for its kind of business left little to be desired.

It is true that in some cases, the technique was not sufficiently developed, so that one or two of the major fundamentals of the control were ignored. Nevertheless, production control in the weaving end of the textile industry reached a high point of development almost sooner than anywhere else.

It is also very interesting to note the soundness of the fundamental thinking of Taylor and Gantt. They, with their early associates, saw the need of taking production planning out of the kindergarten and giving it a higher education. They wrote a rather complete prescription for scientific planning control. The Gantt chart is today still recognized as a very useful tool to determine whether schedules are being maintained on time and if not, where are the shortages.

It is readily evident that the type of production planning required for any specific business must take on the characteristics of that business. There are, of course, certain fundamentals which are common to all plans.

For instance, adequate production standards are essential if proper scheduling and planning of the work is to be successful. Reverting to our illustration of planning in the textile industry, the production to be expected from certain classes of looms on certain types of fabric is known with a high degree of accuracy. It is equally important today that we have careful standards both of machine production and bench work, because one of the fundamental principles of production control is based on obtaining and maintaining the right balance between the available man and machine hours and the work load.

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[1] Paper presented at the Annual Conference of The Society for the Advancement of Management, December 4, 1941.

Starting out with proper forecasts of the probable volume to be expected on different styles of products, the planning records should be built up so that adequate stocks of parts may be available for assembly to satisfy shipping orders.

As a matter of fact, planning for adequate part stocks, wherein the minima shall satisfy sales during the time required to process a new production order, and the maxima are but a little in excess of an economic sized order quantity, is a fundamental principle for keeping the part stocks in step with the rate of sales. At the present time much of the production planning consists in entering the orders in a record not too dissimilar in principle (even if it is a visible file) to Jim Smith's old day book and then scheduling them as best we may against the available man-power and equipment so as to ship when, as, and if we can.

It is only a very short while ago, however, when in the midst of a depression, it was absolutely essential to control production strictly in accordance with a variable sales pattern and so that the stock of parts and finished goods should represent the minimum possible inventory. During this period special techniques were built up, based upon the so-called "factory balance" principle, which is a glorified extension of the textile industry's over- and under-sold records. The type of production control method to be used now should anticipate that we shall probably go back to methods of this type; and for the manufacturer who already has it, he would be well advised not to let it atrophy and dry up. As a matter of fact the manufacturer can give better service on orders with this method even when he is so busy he doesn't know which way he is going to turn next to satisfy demands on production facilities.

So it is still vital to lay emphasis on planning production strictly in accordance with sales or, under present conditions, the required delivery schedules.

The records from which the planning of the production required is developed, form the basis for making the work schedules. In connection with putting these work schedules into production, I wish to comment especially upon Mr. Demougeot's paper wherein he describes the dispatching job in each department. In any type of production control plan, decentralized dispatching is practically essential if the plan is to work well. It is a serious mistake to attempt to load too many machines on departments in the main office. A much better job would be done by the personnel closely informed on the departmental problems of machine maintenance, ability to turn out accurate work, etc.

Another point in connection with production control that is highly essential is the matter of follow-up. In the big plant making many parts we see no adequate substitute for the stockchaser. In the small plant making a limited line of products, there is quite often, a "bottleneck" department about which relatively little can be done without a major upheaval in plant layout. In such plants the bottleneck can be concentrated upon and stock chasing in other departments minimized. A number of years ago a plan was worked out in underwear factories and in hosiery mills which proved very successful. This was called the "color cycle method" of control. Under this plan the orders for a given period, say three days of the week, all bore a tag of the given color, let us say blue. In the next subsequent period the orders bore a yellow tag, and the foremen of the different departments would know automatically within that period that workers ought to be employed either on blue or yellow cards. A color appearing off schedule, for instance, yellow when it should be blue, indicated that that particular order was behind schedule and should be pushed along.

This technique is still of very considerable value in plants making small parts, but in the large plants there probably is no real substitute for the stockchaser. He can also follow up machine efficiency.

The adoption of adequate methods of production control results in production of the maximum amount of goods within a given time and usually with a minimum parts inventory.

One case with which the speaker is familiar involved planning for an hosiery mill which handled approximately 7800 different items of hosiery. That is, they differed either as to size, style, color or pattern. This particular mill sold direct to retailers and was supposed to make shipments within twenty-four hours of receipt of orders. At the time the production control was installed the company was having about 12 per cent of their volume back ordered. After the plan was developed and given a month or two to smooth out in operation, over-all inventories were reduced 20 per cent and back orders were down to three-fourth of 1 per cent.

Production control is and can be useful to the manufacturer. In our present speeding up towards a war economy, the very nature of the problem will be so forced upon the manufacturer that he will have no choice but to develop better planning methods. It is not a coat which the manufacturer can either wear or decline to wear as he sees fit, but which the force of defense circumstances is making obligatory.

Management's Search for Precision in Measuring A Fair Day's Work[1][2]

By J. K. LOUDEN

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GIANT strides have been made in the search for precision in measuring a fair day's work since the days when Frederick W. Taylor first proved that work could be measured with a reasonable degree of accuracy and that what constituted a fair day's work on a given operation, or group of operations, could be established with acceptable accuracy.

Since those first days of work measurement, progress has been made in our search for precision from a number of different angles. One of the more retarding and disturbing obstacles in the search which had to be overcome was the earlier failure of management—and even those engaged in the work of work measurement themselves—to realize the full extent of the problem, to realize the caliber of men required properly to perform that work, and to realize the limitations of the measuring tool itself.

For example, work measurement—as we shall show later—affects many different aspects of a manufacturing enterprise. It is itself affected by many factors other than the actual performance of the work. The analysis, of which work measurement is a part, introduces or lays bare many other problems which must be fully dealt with before work measurement itself can be either accurate or successful.

Time study is the tool used in measuring work, and the objective of time study is to determine how long it should take a human being properly fitted to perform a given operation, to accomplish a specified result in a specified manner. To use time study for any other purpose is to abuse it; and misuse has to a large degree been responsible for the shadow which has hung over time study for a long time.

Motion study, the twin of time study, has as its objective the problem of determining which of various human procedures is best suited to accomplish a given result. The fact that the problem of determining what procedure should be followed to accomplish a given result interlocks completely with the problem of measuring the time required for achieving this result, demonstrates clearly the usage of work measurement. We cannot decide what is the most suitable method of performing work if we do not have time values for purposes of comparison. On the other hand, we cannot properly measure work if the manner of doing the job has not been clearly specified. As stated by Ralph Presgrave in his article on "Effort Rating" in the 1939 Fall issue of ADVANCED MANAGEMENT: "Motion Study which is purely analysis cannot achieve its full purpose unless its results are given concrete existence through the agency of an accurate system of measurement, the basic principles and techniques of which are unassailable."

Failure of management in the past to realize the magnitude of the problem of work measurement, the inherent difficulties it has, the high degree of judgment it demands, led them to entrust this work in many cases to people who were unfitted by experience, education, and ability properly to perform it. We can all remember when time study was classed largely as another clerical operation, and it was felt that anyone who could read and write, add, subtract and divide, or who had operated a machine successfully in the plant could be a time study man. That illusion—which, fortunately, is rapidly disappearing—has caused many of the difficulties and much of the disrepute into which the work of work measurement has fallen. Virtually all well-managed companies today recognize that it is impossible to get a man of too high caliber on industrial engineering work, of which time study is one of the phases. If they are going to have successful results in work measurement, they must have fully trained, competent men performing this work.

Another retarding influence in the past toward achieving precision in work measurement has been the lack of desire on the part of those engaged in this work to face the problem squarely, and by admitting the inherent weaknesses and difficulties, lay a sound program of research and study to develop these "unassailable basic

[1] Paper presented at a meeting of the New York Chapter of The Society for the Advancement of Management, January 15, 1942.

[2] The author acknowledges indebtedness to Mr. J. M. Juran and Mr. Ralph Presgrave for much source material in preparing this paper.

principles and techniques." The motion study twin has received much study and much intensive promotion of good, sound practices and techniques. The time study twin—due to its unsavory reputation and the difficulty of the problem—has been shunned. Yet it, too, must have this same study, research and improvement in order to raise its prestige and performance to the high level that motion study now enjoys.

A most important and vital point that must be considered and accepted in discussing work measurement is that the problem of determining what constitutes a fair day's work must be kept entirely separate from the problem of how much shall be paid for that fair day's work. In the past time studies and piece rates have been synonymous. This is a grievous error: it has created considerable confusion, and must be corrected.

The men engaged in work measurement must be free from pressures of any sort from any source other than that of determining what is a fair standard of performance or a fair day's work on a given job. They must have emphasized to them that their goal is to develop a standard for performance of work. This standard is not to be what a superman or a below-average man, an old man, or a young man can do, but what we can expect a normal worker to do in the performance of that job. This standard to be set on a fair, honest and equitable basis, not requiring killing exertion, but at the same time requiring a normal day's output. It is not to be a tight standard or a loose standard, but a right standard. The amount of money that will be paid for the performance of that amount of work is entirely irrelevant to the problem of determining what constitutes that fair day's work.

Time study data are used for purposes other than the basis for payment of wage incentives. They are used in redesigning layouts, equipment, and products. They are used in determining standard costs. They are used in cost estimating. They are used as the basis for departmental operating budgets, and, of course, they are used to determine standards of a fair day's work; and these standards can also be used as the basis for the payment of bonus. However, should incentives be outlawed for any reason whatsoever, it would still be necessary from a manufacturing operation standpoint to make time studies and develop time study data for these other usages. The fact that money incentives would not be paid on the basis of a fair day's work would not eliminate to any extent the requirement that we know what constitutes a fair day's work. There are means of securing a fair day's work from employes other than by the use of money incentives. However, that is by far the most positive method.

I do not intend to imply that the determination of a fair day's work is but a by-product of time study. On the contrary, it is one of the principal uses. It is this usage which demands that there be precision in work measurement and that we improve the degree of precision now commonly extant more than any other single usage.

Time standards used in cost estimating and the like are subject to a number of dilutions before they appear as a part of the final answer. That means that a high degree of precision may not be required for that purpose. Yet in the matter of determining a fair day's work on the basis of which a bonus will be paid, an error of 15 or 20 per cent in the measurement of the amount of work in a given operation will mean a 15 or 20 per cent variation in the earnings of the man who performs that operation for a full work period. Therefore, it is this usage more than any other which demands precision in this work.

We must make certain then that time studies used for establishing standards that will serve as a basis for incentive payments are made and analyzed with a precision which is proof against reasonable challenge by labor or management. And the pressure for precision must come from these two groups, although this challenge for precision is directly to industry to improve still further the precision of its time studies.

In considering the problem of how we can improve the precision of measuring work, we must first consider our present techniques and wherein the variables exist, for it is in these variables that the problem lies. It is universally conceded among engineers that the most important variable of all is in the estimate during the time study of the operator's efficiency. No time study work can escape this problem. All time study men have encountered it, and various methods are in use for improving the degree of estimate.

These methods have been classified by Presgrave as follows:

First, the use of mathematical formulae based on the assumption of some expected degree of consistency among operators.

Second, the use of standardized time values based on defining the various schemes of human effort and establishing for each a standard time.

Third, levelling,—a technique of estimating for the operator under observation the degree to which he conforms to the observer's standards of consistency, skill, effort, and the like.[3]

[3] Abstracted from Presgrave, Ralph, "Effort Rating," ADVANCED MANAGEMENT, Volume IV, No. 5, Fall, 1939, pages 126-133.

Another method that might be mentioned is that of selected times. This involves the selection and use by the observer of only those time values that conform to his standards of good performance.

None of these methods have thus far met with wholehearted approval by engineers in the time study field. The so-called statistical or formula approach is least understood of all, and attempts to analyze the data scientifically are sometimes confused with the attempts to use empirical assumptions to replace the observer's judgment.

It is universally agreed by competent men in the field that the judgment factor in the making of a time study is paramount. Therefore, the problem is to determine the extent to which different engineers will arrive independently at the same answers and the consistency with which they will continue to arrive at substantially the same answers.

Studies have been made on this point within individual companies, and in a few instances by different companies working together to determine the degree of variation their time study men exhibit while analyzing the same operations. The fact that variations exist goes without saying. The important fact is that the degree of variation among competent, trained men is surprisingly small and within the realm of what could be considered acceptable.

Data from such studies of present rating techniques which I have been privileged to see, while not all conclusive, tend to suggest certain conclusions among which are the fact that in those instances the substantial majority of a group of competent men arrived at answers which fall within acceptable limits from the group average. One such study indicated that only 5 per cent of the ratings were more than 15 per cent from this group average. Also, that knowledge of the operation is an important factor in consistent rating. Some engineers were continually significantly higher or significantly lower than the group average ratings, and likewise, some are more consistently within the group average than others. However, here again, the nature of the rating plan has an important bearing upon the results obtained. The major results of such research and studies indicate emphatically the need for improvement in precision in work measurement.

Data from such studies strongly suggest that the group is much less subject to error than is the individual. This, in turn, suggests that we should extend, when practicable, the use of ratings by groups rather than by individuals. Group rating is in everyday use in other fields of endeavor. Therefore, it is not unlikely that it would also prove advantageous in this case. One company with which I am familiar, never—unless it is impracticable—has fewer than two engineers working on the same problem. This is done so that these men will be able to check each other's judgment and have the benefit of their combined experience in arriving at the proper answers on their studies. Then, before the data prepared by these engineers is accepted or used, it is checked by staff engineers working in that plant. In making this check, this company has established the limit that there must not be more than a 5 per cent variation in standards established on machine-paced operations, nor more than a 10 per cent variation in purely hand-performed operations. If the check studies differ as much as these limits, then the whole problem is reviewed. Then, before the data is finally accepted, a staff engineer from the central office also makes check studies on at least the major portions of the installation; and here again, his findings must fall within the limits specified. This practice in that company has proved that group rating offers an excellent probability for substantial improvement in precision.

Again, some companies, in addition to the use of this group rating and checking method of attaining precision, are developing standard data tables which are composed of data proved in actual work practice and tested under actual working conditions. These data are used as check or bench-mark guides against time studies currently being made as well as for the direct development of work standards, when the tables are complete enough to permit their use to that end.

The needs and uses of these data are carefully planned in advance and kept in mind when the studies are being made so that the resultant data will be of the greatest possible value. It is then correlated in any one of a number of different ways to again be of its maximum use. For example, it will be grouped by elements of work with all the variables that have been measured at that time under each element, so that as similar or identical variables for that same element are studied, the time values can be checked against data prepared earlier. Then, again, these data are carefully checked in actual practice through production studies and other time studies, with the results noted and variations indicated, with reasons defined when possible. Then, too, these data are assembled by operation or operations performed on certain specific equipment, so that standard data tables can be developed which will permit establishing standards without time study on work on

certain specific equipment. Here, also, the data entering into these tables are carefully checked through actual practice. This is a long drawn-out, careful job and it must be done in a thorough manner or it is of little value.

Other companies are working on the problem of attempting to establish time values for fundamental elements of work that will serve the same purposes of checking time studies and also the direct development of standards. This is an even more laborious process requiring the most complete understanding of the problem and the use only of men with high technical proficiency and ability.

Some of our universities are working in their laboratories on this same problem of studying the precision of our present methods, determining just what are the variables involved in measuring work, and how we can develop means of improving the handling of these variables. They are, however, all too few and limited by means and facilities to make the degree of progress that the importance of the problem demands.

Recognizing the need for improvement in the ability of time study men to judge properly the operator's efficiency during a study, and recognizing the lack of an organized, co-ordinated study of the problem on a national basis by an independent group, The Society for the Advancement of Management a little over a year ago established a committee on the Rating of Time Studies to work towards the establishment and determination of grading or rating standards for time study purposes. This committee has made substantial progress since its inception, especially so in view of its limited funds and the small amount of time the various members of the committee can devote to it, due to the pressure of war work in which all of them are deeply submerged.

However, the first approach they are taking is to make use of the fact that group rating offers a high probability for substantial improvement in precision, and to foster group rating through study by the use of films. The idea is to make copies of a number of films of familiar shop operations, circulate these films among many companies, and obtain from hundreds of observers their ratings of operator efficiency. The resultant composite ratings, together with the data obtained from analyses of the film themselves, could then be made available to these same observers, who could use such films with the knowledge of how a large section of the Industrial Engineering profession had rated them.

Conceivably, such films could be used for training new engineers to develop a concept of the standard level of operator performance. Another possibility would be the recalibration from time to time of experienced engineers. It was the opinion of the Society that such a study could best be undertaken by an independent group like The Society for the Advancement of Management or by an educational institution. In addition to providing a calibrated set of film, the resultant data would be of much value in pointing the way for further study.

The degree of co-operation that this committee has received from industry to date is highly encouraging, and it is the committee's sincere hope that it will receive hearty co-operation from industry in this connection—the same as industry has given in preparation of physical standards, chemical standards, and the like.

As stated, precision can be greatly enhanced by group rating and group training in the art of rating. Therefore, it is the intention to take advantage of this relatively simple approach to the problem to improve precision in rating as quickly as possible and to as high a degree as possible, pending further research and study for some more concrete and superior solution to the problem. No one can question the superiority of making objective measurements on the basis of a universal standard plus measuring instruments tuned to that standard, in lieu of making subjective measurements on the basis of worded descriptions plus human judgment. We must remember that on those occasions when science has succeeded in defining a new standard and in constructing new measuring instruments for expressing in numbers what could formerly be expressed only in adjectives, the associated activities have benefited markedly. It is in such instances that an art has been converted into a science.

We should all like to see developed standards for time of motions, and, indeed, many have taken steps in that direction. The problem is to construct such a standard; and anyone who faces that problem soon obtains an appreciation of the tremendous task before him. There are motions of various members of the body, restricted and unrestricted, involving direction in three dimensions, with associated accelerations and decelerations. There are many kinds of grasps. There is the problem of synchronization of the eyes, hands, and so on. A moment's contemplation of any one of these is enough to drive home the magnitude of the problem. Therefore, I should not want a lack of time here at this Conference to minimize the extent of the problem to any degree. At the same time, we must not let the magnitude of the problem discourage us or cause us to

cease an unremitting effort towards finding both intermediate and eventually final solutions to the problem.

We have all heard it stated that the human being is such a complex mechanism that the physiological factors alone are almost too great to overcome. Here, again, we must not let those facts deter us from our endeavors to improve this precision in work measurement any more than the electrical engineer has permitted a lack of complete knowledge of the nature of his problem to deter him from making vast gains in that field.

We are not concerned so much with perfection as with improved precision of measurement to the point where we have the proper balance between cost of precision and value of precision. It is evident that the problem is too great an undertaking for any one individual or probably any single organization. But it does not seem to be too big for industry generally to undertake it. In fact, it MUST be undertaken. Many individual organizations have already done much work on the problem, and it is the hope of this committee of The Society for the Advancement of Management that we shall be able to enlist the aid of these companies and institutions that have been studying and working on the problem, to pool their data and findings to the best over-all advantage.

In this matter of achieving precision in the measurement of work, management and industry in general must face the problem of getting the best and most that can be obtained from our present methods. This can be done in great part by further realization of the absolute necessity of entrusting this work only to competent, trained men; by giving it the proper appreciation, understanding, and prestige it must have.

Recognizing further the limitations of our present methods and the need for further research and study, we must establish ways and means for collecting more and new data that will supply additional information and facts to support progress towards greater precision in this work. It is not enough that we attend meetings to discuss the problem, or that we attempt within the limitations of our own organizations to work toward its solution, we must support and co-operate with such independent national groups as this committee on the Rating of Time Studies if we are to achieve our goal.

The following statement enunciated by William H. Leffingwell in 1921 is as valid today as when it was first written and bears careful study as an aid to present problems:

HOW TO MANAGE

1. **Define your purpose**
   You must know *What* is to be done before you can know *How*. This is your master task.

2. **Analyze your problem**
   Your master task will then break up into many detail tasks. Consider them all—neglect none.

3. **Seek the facts**
   Study every condition governing each task, *find* the undesirable elements to be eliminated, the desirable elements to be retained. Then standardize right conditions.

4. **Devise the one best method**
   Aim to conserve *Energy—Time—Space—Material.* Determine relation of details to Master Task.

5. **Find the person best fitted**
   For each task certain personal qualities are essential. In each person certain qualities predominate. Find the person best fitted.

6. **Teach the person best fitted the one best method**
   Not by driving, but by thorough patient teaching are understanding and skill developed.

7. **Plan Carefully**
   Right planning of arrangement and sequence of work will enable you to accomplish tasks in *Logical Order—Accurately—Quickly—Economically.*

8. **Win Co-operation**
   Co-operation means working together. It cannot be demanded. It must be won. Accept your share of the responsibility. Respect the rights and aspirations of others.

THIS IS SCIENTIFIC MANAGEMENT

Labor Views the Working Day[1]

By SOLOMON BARKIN
Director of Research, Textile Workers Union of America

THE present emergency has placed two special obligations upon management. It must be economic in its use of equipment and wise in its methods of employing labor. Both must be conserved for these crucial times. In attaining this balance between immediate and prudent use management will rely upon engineers to a great extent. They will translate the plans for victory into the blueprints and schedules of production. They will also be called upon to establish standards for labor's production. The engineering profession must be alive to its responsibilities and be prepared to discharge them competently. The American people depend on their soundness of judgment and method.

The vast body of tested knowledge and experience assures us that engineers will make sound contributions. But the record to date has not been too bright, probably because management has restrained the engineer from realizing his full potentialities. But in their activities affecting the setting of jobs and production standards, engineers are treading on precarious ground. They have less tested knowledge and fewer proved methods than they may believe. They have operated largely on assumptions and techniques which have not undergone the rigorous examination required by the scientific method. Nevertheless, they have exuded the self-confidence common among practitioners of the mathematical sciences. Such self-confidence has been misleading employers, confounding workers and deluding themselves.

Having appropriated for themselves the field of setting job standards, the engineers have attempted to apply the strict mathematical procedures of the physical sciences to the problems of labor management. This effort has provoked tremendous protests which originated with their first efforts and have continued down to the present day. In fact, no other phase of engineering has been subject to so much attack. Since engineers have assumed a vast responsibility in the field of industrial relations, the profession must closely reexamine its performance to determine whether it is really aiding in establishing objective standards for setting job assignments.

[1] Paper presented at a meeting of the New York Chapter of The Society for the Advancement of Management, January 15, 1942.

It is the union's purpose to outline certain obvious difficulties and shortcomings in present practices with the hope of providing practical safeguards and lines of future inquiry. We shall not discuss the problem of incentive wage plans. Engineers have cavalierly dismissed most of its complications by proceeding on simple assumptions which do not do justice to the scientific attitude.

The determination of production standards for workers is of vital importance in our present emergency. Time is of the essence in the delivery of our war materials. The well-known adage that "haste makes waste" should, however, caution us against too simple conclusions.

Probably the greatest lesson we have learned in the field of so-called human engineering during the last three decades has been that workers are not machines. Few workers are identical. They cannot produce within a short period a constant output per hour. The productivity of the same worker varies considerably, even within the same day. The work curve for the usual eight-hour day is well known. But most important of all, it has been proved that it is frequently possible to produce per man more on a short work week than on a longer one. The losses in efficiency and the human toll resulting from long hours more than offset the opportunity for greater production during the longer hours of work. In determining hours of work and production standards, one must consider their likely influence on actual production, the physical and mental well-being of the worker, his span of full usefulness and proper standards of health.

British Experience

The current British experience corroborates this conclusion. Exhausted workers cannot produce and will either find methods of escaping the burden of work or will fall victim to its load and thereby reduce the period of full usefulness. The end result will be a decline in national production. To meet war needs, labor shortages and blackout rules, English employers with governmental authorization extended working hours

beyond the pre-war forty-eight hour work week. Munitions workers after the Fall of France worked seven days and sixty and seventy hours per week. The deleterious effects of the long work week became evident within two months. As a result, the government immediately called a halt to this practice "to prevent the health of munitions workers (from being) severely affected." Industry and government observed that individual productivity dropped; absenteeism and lost time increased; accidents jumped; and disabling sicknesses became more prevalent. The Ministry of Supply declared shortly that "excessive overtime was self-defeating." It leads to "fatigue and consequent decrease in the worker's efficiency." These effects were observed despite the payment of overtime rates. The seven-day work week was therefore abandoned as "particularly costly, unsatisfactory and unpopular." Industry was told to limit Sunday work to "essential repairs and emergency work." One industrialist summed up the situation by saying that "working seven days a week means paying for eight days (double pay for Sunday) and getting only six-days' 'output.'" (The same conclusions would not apply toward Sunday work in case of employes who work less than seven days.)

Not only was Sunday work disapproved, but observance of holidays was recommended. Vacations were also urged. Organized rest periods were proposed. The Ministry of Supply urged a three-shift system. The government told industry to reduce hours to forty-eight per week for women and fifty-five or fifty-six for men. Only maximum hours for men were increased to permit an additional seven or eight hours overtime for which they were paid at overtime rates.

Germany instituted a long work week at the beginning of the war, but also changed its policy more reluctantly and after a longer period of trial when the ill effects of long hours on health and production became serious problems. Such a step proves to be a miscalculation which yields little if any increase in actual production beyond an immediate spurt. If working hours are extended over any considerable length of time, their injurious effects delay the recovery both of production and health for so long a period as to offset completely any temporary gains. It is particularly important for our country to recall these facts in our efforts to expand production. Our federal authorities have recognized this experience and are recommending the maintenance of our forty hour week and the employment of four shifts. Such working schedules guarantee maximum production and a healthy working population.

The effects of long hours in producing fatigue have been observed over a number of years. The current war experience dramatizes these findings. Labor in the United States has long fought for shorter hours and finally secured the widespread observance of the forty hour or shorter work week. In the same effort to prevent too hasty physical and economic collapse of workers, the trade union movement urged the adoption of vacations with pay, now a common practice in manufacturing industries. In addition rest periods are being increasingly urged.

To prevent diminished capacity for doing work induced by fatigue labor has sought to correct conditions of work by demanding compensation for industrial accidents and disease. The workmen's compensation laws have made accidents costly. Employers responded and the national safety movement started. While progress has been made, conditions in the workshops of America continue to take their costly human toll. This situation must be remedied. Engineers have contributed toward increasing workers' productivity through the use of operation analysis and motion studies which have eliminated unnecessary motions.

Organized labor and the community realize the importance of conserving the physical and mental well-being of the entire working population. Low income, malnutrition, sub-standard housing and limited education and a feeling of insecurity have been recognized as vital factors in increasing fatigue and thereby reducing the worker's production capacity. Movements are under way to ameliorate these conditions. The more completely these defects are remedied, the greater will be the productive capacity of our American worker.

Within the limits defined by hours of work, conditions surrounding employment, the physical and mental condition of workers, and the nature of the jobs themselves, there is another factor which determines the extent of fatigue or the capacity for doing work. It is the rate or intensity of operations at a particular job. An operation which is so energy consuming that the allowed periods of recuperation are not sufficient to permit recovery are just as likely to induce the ill effects of fatigue as are long hours. It is this phase of the problem to which we shall now direct attention.

Long hours reduce hourly output; shorter hours increase hourly output. One outstanding student of these problems has concluded that workers unconsciously attempt to protect themselves from excessive fatigue. They adapt their intensity of effort to the length of the working day and week. He failed to note,

however, that the individual worker is at best able to sense only the immediate and not the ultimate physiological and mental effects. Similarly, workers have sabotaged or openly struck against efforts to increase the intensity of labor expenditure. Strikes against the "stretchout" and the "speed up" are well known. Workers have demanded that the pace of work shall not be excessive and shall be measured by the same criteria which are employed in the determination of the length of the work week. These should be not only immediate output but also the long-term rate of production, the human and economic cost and finally the effects on the health, and the physical and mental well-being of the workers under present social conditions.

Management's answer to this request for objective measurement has been the introduction of time and motion studies. Labor's dissatisfaction with them lies not only with their intrinsic failings, but also with the use to which they have been put. Time and motion studies have become the means for frequent job assignment changes to maintain the standards of performance allegedly standardized by management. They have been tightening up jobs which may through the passage of time have been relaxed. The increase in mechanical and repetitive work in industry has of course extended the field of profitable application of this technique. The close articulation of processes has made it imperative that the worker observe these production standards lest the flow be broken. The worker must adapt himself to these standards to maintain the rate of production established by management. The dependence of earnings and the security of the job itself on the attainment of these standards has of course heightened the fear of and antipathy toward these methods.

Organized labor until recently took a firm position against time study techniques. They are still prohibited on many types of governmental work. Nevertheless, labor is aware of the usefulness of objective measures. It is, however, skeptical about the value of time and motion study techniques in their present crude form and usage.

One of the most serious abuses of the entire technique is the fact that this tool is put in the hands of many improperly and insufficiently trained people. The superficial simplicity of the procedure which has made time study men out of many college, or sometimes high school, graduates, has been its undoing. It has been widely and indiscriminately applied with many unfavorable results and reactions.

One of the grave deficiences in present methods of setting job standards is the lack of a general definition of the worker's expected performance. There is no objective or tested definition of the "average" which is employed to describe the basic expected level of efficiency. In fact, the very term "average" or "normal" is misleading. The terms have been borrowed from the mathematical sciences where they have precise connotations, and applied with abandon in this field. Time study men don't expect most men to be about the average. By the very nature of their incentive wage systems, they know that most workers will attain from 12 to 33 per cent above that average. The nearest description to be found of the term is that it represents the particular time study man's conception of what a worker should perform—a base rate for a job. This image of the normal or average worker has been established without reference to the workers actually employed on any given job. The time study man assumes that through experience and intuition he will be able to gauge a normal job performance. Most of them comfort themselves with the thought that despite the "present lack of laws and facts pertaining to these qualities . . . a discriminating time study man whose judgment is mature will have but few difficulties in setting values for them." [2] Yet the time study man does not know and cannot tell whether the normal which he has set would do as well for men and women; for night and day shift employes for forty or forty-eight hour levels of operation. Nor can he state whether the particular norm will induce absenteeism, sickness, premature acceleration of degenerative diseases or for that matter answer any other specific inquiry. At best the time study man must confess that his own standards are born out of his experience. They are not related to a truly objective definition of goals or criteria. They certainly are not derived from a careful evaluation of the composite effects on production, health and cost. Measurements of these effects have not been attempted since the basic gauges have not been described or precisely defined.

Your own society has recognized the above criticism in the appointment of your committee on Rating of Time Studies of which Mr. J. K. Louden is a member. It has, however, limited itself to determining the differences among the standards employed by different engineers. The committee is attempting to get at this problem by collecting the judgments of the co-operating engineers. But this procedure does not get at the prob-

[2] Shumard, F. M., *A Primer of Time Study*, McGraw-Hill Book Company, Inc., New York and London, 1940, page 21.

lem of actually defining the standards, determining their propriety or establishing criteria for determining the propriety of these standards. What qualities enter into the determination of a standard? Will the description of the standard for a simple job compare with that of a complicated job? Until investigations into this basic problem are conducted little confidence can be expressed in the superstructure built on present time study assumptions. One is moved to inquire into the comparative validity of the conclusions derived from experienced qualitative guesses and those developed from present time study techniques.

The present emergency has pushed these problems to the fore. If the present concepts reflect previous operating experience are they useful when industries are being manned by new workers, and only partially trained supervisory personnel; when new tensions exist in the community; when shift operations are being employed; when the proportion of female employes has increased; and when numerous other basic changes have been made? A thoroughgoing inquiry into present standards is imperative so that we can develop norms that could be adjusted to the changing characteristics of the personnel and the conditions surrounding industry.

The same doubts can be expressed about the ability of time study men to rate workers either above or below the base. Lacking a precisely defined basic level of performance the task of rating workers becomes exceedingly difficult. To develop any rating schedule, we must list the precise qualities to be studied. We must know what they are so that we can measure them. Many of these qualities would represent complex activities and not easily defined psychological units. Do we know the precise values of each quality and what value should be assigned to various combinations?

Even when these problems are set aside we must still ask: What type of data shall we employ—impressions, actual facts or verifiable judgments? How shall ratings be made and how shall they be scored? How refined shall values be? How many investigators shall rate a single person and over what length of time should the study be made? How shall the ratings be averaged? What reliability have the ratings when finally made? We can report that efforts at rating less complicated phenomena in the field of education than those we are now discussing have proved to be of questionable value. The lack of clear and careful thinking on these problems and the failure to develop standards according to the basic rules of scientific proof place the entire technique of time study job setting in a dubious light.

These failings inherent in job assignments established by this means suggest the fundamental reasons for labor's questions. Time study techniques are founded on untested assumptions. But even the mechanical techniques of securing the data cannot escape criticism. They have not been thoroughly studied; the practitioners are not versed in the basic qualifications or guided in detail as to the methods of determining the usefulness of results. Snap-back time study methods have been preferred in practice, whereas continuous and cyclical methods are more valuable. Certainly they leave less doubt concerning the completeness of the studies. Stop watch methods have been found wanting in many instances, particularly where the results have been used for setting rates.

Probably some of the most difficult problems have arisen in the selection of persons to be studied and time and length of studies. All too often time study men select the workers "from whom they can expect the best results." Generally they are the more intelligent, skillful and consistent workers. But even these selections are made on a basis of judgments and not on measurements. Seldom is an effort made to secure data for different hours of work, shifts, times of the year or other variables which influence the results. As for the length of the study, practices differ and the guides are vague. Careful selection involves the highly technical problem of statistical sampling. Opinions are out of place. The number of studies must meet the most exacting statistical criteria concerning sampling. Yet few practitioners have even outlined adequate criteria for selection. In choosing the representative time from a series of observations, we again need a highly refined statistical technique. Yet time study men have conjured up personal inventions. In addition, to averages, modes, medians, there are such adaptations of alleged statistical practices as the good time method, elimination of abnormal times and the Merrick standard division procedure. The latter three are statistically indefensible.

If all of these problems were studied and soundly resolved, we would still continue to face the practical problems of getting fair studies. We have found too great a disposition on the part of time study men to short cut the listing of elements in a job. They tend to eliminate casual movements, variations and peculiarities of a job. The job descriptions have been inadequate. They do not embrace fully the details of a job such as the conditions in which the machinery and work

room were to be kept, the methods of conveying the removing materials and finally the methods of performing the particular job.

The use of time studies requires a high type of management equipped with information and personnel able to maintain the level of performance required by such a system. Unfortunately, too many managements which do not qualify are employing time study systems. Every error, shortcoming, omission and inaccuracy in a time study falls upon the worker either in the form of lower wages or overwork. That is another reason why the place of the time study technique must be re-evaluated.

The calculation of the job on the basis of the above data is a questionable mathematical procedure. Possibly, some studies are conducted over an adequate period of time to furnish information on unavoidable delays, but these are the exceptions.

The method, however, of allowing for fatigue and personal time by making percentage additions raises problems of a most fundamental character. The present method presumes that fatigue allowance will only be partially consumed through rest. The hope in fact is to induce workers to employ as much of this time as possible in actual productive work so that they might earn an additional bonus or premium. Few concerns actually make provisions for rest periods under a system of time studied jobs. There is no guarantee that the worker will actually take time off to compensate for the physical exhaustion created by the job or offset the undesirable effects such as monotony, boredom or mental exhaustion. The present method is no answer to the problem of fatigue. Besides being wrong in conception, there are no standard methods of determining the allowances. Confusion is common. Practices differ so widely as to inspire little confidence in any man's judgment.

These criticisms have resounded in many quarters. Psychologists, statisticians and management experts have joined in raising these questions. It is unfortunate that time study men and those interested in this technique have not to date undertaken fundamental research. Thoroughly tested data on this subject would now be of immense value in making adjustments in industry to our war time needs. It is imperative that this society immediately dedicate itself to this task. Unless engineers themselves undertake this job, it will be delegated to others. To prevent this technique from being completely discarded, the engineering profession should develop a scientific foundation for such work. Labor believes that the time and motion study technique provides a valuable adjunct for management and a means of providing objective data for collective bargaining relations. Unfortunately, it is not now in a form to be used with full confidence.

The continued use of the time study technique by management has compelled labor to make certain practical demands on management to improve the actual data secured by time study engineers, and to permit more careful appraisal of the results. In developing these demands trade unions have not accepted the technique, but are trying to prevent the abuses which have frequently occurred in its application. Labor has successfully sought to subject the setting of job assignment to the more realistic method of collective bargaining and is attempting to improve the usefulness of the data secured from time studies for this purpose.

Labor has requested that complete job specifications be furnished outlining five different phases of the job:

1. The methods and conditions of delivery of material.
2. The condition of the machine and standards of machine performance.
3. The conditions in the work room.
4. The methods of performance on the job.
5. The methods and conditions for the removal of material.

A complete description of the job will give the local union representative the information with which to check all basic time studies. It will permit employes to review all job elements to determine their inclusiveness. Incidentally it provides a means for enforcement of the final job standards so that deviations from prescribed levels can immediately be brought to management's attention.

Before studies are actually begun, unions insist that employes must have mastered the job routine. The union committee must be able to check the degree of observance of working conditions with those prescribed by the job specifications. Adjustments in specifications or job itself must be made to assure full conformance. The union and the management should then consider the varying possible types of influences which might affect the results. It is important to study the day and night shifts separately; beginning and end of day and week; and different times of the year. Varying operating conditions on the same job should be considered. In selecting workers, wherever possible, all employes should be studied. If it is not practical, an adequate sample should be chosen with thorough understanding of the weighting which each is to be given in the final

results. Such studies should be thorough. No synthetic calculations should be employed. The studies should be made jointly by the union and the management. All results should be checked and verified.

Management and labor should consider the results only as a basis for the determination of work assignments. They are not in and by themselves sufficient. Careful study by both groups will disclose biases, omissions, inaccuracies and distortions in the data. They should be utilized in the bargaining process.

Labor is insisting upon definite rest periods and provision for meals away from the machine. The TWUA recently adopted the following resolution that "specific rest periods of at least thirty minutes for each day shall be granted during which time workers may leave jobs and enjoy complete rest."

Furthermore, the use of the time study results for incentive wage systems should be avoided. The measured work day should supersede incentive wage plans.

The above suggestions do not correct the basic shortcomings in time study techniques. They do, however, eliminate the present unjustifiable attitude current among engineers and practitioners of time study that there is something sacred about the results. It will tend to remove the veil of mystery and holiness which has clothed the entire practice. By subjecting the entire procedure to close scrutiny by labor and considering the results as merely the raw materials for collective bargaining, the one-sided biases now inherent in the practice may be corrected. The conclusions derived from such negotiations may not be any more scientific than those secured by the time study engineer but they will at least represent the experience and opinions not only of management but also of the worker on the job, and give proper weight to the human factor. They will be accepted with more confidence and less resistance.

The engineering profession provided the techniques for setting job standards by contributing time and motion study. They were pursued under the sheltered protection of management which established immediate productivity as the sole criterion of reliability. The increased value assigned to the community's well-being has, however, necessitated a broader view of the problems of the worker. The growth of collective bargaining and the organization of workers have also made this view imperative. Management and labor can meet this responsibility jointly by utilizing these broader considerations as the basis for their relationship. The engineer must incorporate them within the entire framework of job setting. It can be done most successfully by careful scientific investigation of the problems involved in measuring human effort and prescribing levels of performance based on the consideration of immediate and long-term productivity, the human and economic cost, and the effects on the health, physical and mental, of the worker. A fund of tested knowledge and procedure can provide the objective basis to advance rational relations between labor and management, the ultimate goal of collective bargaining. This society can perform a real service to the nation by taking the lead in this direction.

Give and Take in Bargaining on Wages[1]

By JOHN R. STEELMAN

Director, United States Conciliation Service, United States Department of Labor

Delivered by CHARLES T. ESTES

Commissioner of Conciliation, United States Conciliation Service

WE ARE now engaged in a difficult struggle to maintain our American way of life. Our minds have been turned to our immediate problem of defense and war production. Our war effort is demanding that as civilians we give up many materials and as this goes into effect many industrial changes are taking place. New industries are appearing, established industries are rapidly growing, the amount of skilled labor is increasing, and management is changing techniques. These advancements and changes belong to our present picture, but to a *post-war* picture, they will present many distortions. It is, therefore, necessary that we give a part of our thought to planning for this *post-war* economy.

This New Era of Facts

Among problems that relate to the present and future, one requiring long range planning is wage structures. One of the most interesting observations concerning wages today is that collective wage determinations formulated around the conference table are increasingly being arrived at through the presentation of factual economic and statistical material.

Such economic material includes wages as per cent of production cost; cost of living in relation to wages; prevailing wages; employment factors; and job evaluation with due consideration given to the abilities of employes, conditions in the plant and possibilities for advancement. Let us consider some of these points.

Wages in Relation to Cost of Production

Wages are frequently determined in the light of their relation to the cost of production. This, like the other points we will discuss, is an interesting and important factor to consider, *but* like the other points, it is only *one* factor. In this case, the relation of wages to costs so varies in different localities in the same industry and between different industries because of plant facilities, capitalizations, and policy that it would be difficult to formulate a workable index.

Who is to determine whether the wage rates should be set according to the ability of the company to pay; according to an ever changing rate of production; according to effect upon the consumer, or upon some other standard? Commissioners of the U. S. Conciliation Service do not attempt to say. Our job is to bring harmonious labor-management relations.

Wages in Relation to the Cost of Living

In this time of rising prices, we hear much of the importance of the relation of wages to the cost of living. Employes are seeking wage increases in proportion to the rise of living costs. They are seeking cost of living clauses in contracts, so that wages will be increased in proportion to the cost of living during the life of the contract. Employers are frequently using the cost of living clause as a bargaining point. They promise to graduate wages according to living costs if the employes agree to accept a considerably smaller basic increase than they have demanded.

At the present time, monthly indexes on the cost of living are prepared by the Bureau of Labor Statistics of the Department of Labor for twenty large cities, and by the National Industrial Conference Board for fifty-two cities. Since these indexes take into consideration the cost of a large number of items consumed in varying proportions, it can easily be seen that judgment in weighting these factors partly accounts for the slight differences in these indexes.

The cost of living index of the Bureau of Labor Statistics is available to Commissioners of Conciliation for their negotiations. They use it as one of the many factors in viewing the entire picture. Of itself, it is not a wholly accurate measure, for cost of living is only one of many factors which affect the wage market.

[1] Paper presented at a meeting of the New York Chapter of The Society for the Advancement of Management, January 15, 1942.

Employment, supply and demand, and many other factors enter the picture.

Prevailing Wage Rates

Prevailing wages for specific types of work in certain areas has been an important wage factor for a number of years. Frequently, in a dispute when wage increases are shown, the employer claims to be paying as much or more than his competitors for similar work loads in the same area. When this fact is disputed, the employer and the employes frequently agree to have a study made to determine the truth of the statement.

Although the Bureau of Labor Statistics is responsible for wage information, the Secretary of Labor has designated the United States Conciliation Service, when requested by labor and management, to make work load studies, job analyses, and job evaluations.

In such a case as above stated, the Conciliation Service might study the work load charts and compensatory wage rates for six competitive industries. Without disclosing individual figures, the average would then be presented to the employer and employes without recommendation. In most instances a satisfactory solution has been worked out when an impartial representative presents such facts.

Employment—A Significant Factor in Wages

The number of unemployed workers is a significant bargaining factor. When the number of unemployed is few, bargaining is good. When the number of unemployed is many, there is little bargaining opportunity.

A rise or fall in wages must be considered in connection with the employment market. Will rising wages bring better workers to a particular industry and thus increase the rate of production or will rising wages create unemployment because of the competitive market?

Job Evaluations

Workers have often been paid for their skill, their efficiency, their actual production value, or for the possibility their job held for advancement. It is not frequent, however, for workers to be paid for the combined evaluation of these factors.

Cases are sometimes deadlocked because the union claims the company has no wage plan and is discriminating against certain workers. In such a case, a Commissioner of the Service with technical experience may be invited in by the company and the union to assist a company and union man in evaluating the jobs in dispute. With a fair and impartial evaluation study, it should then be possible to set a wage plan. The fact that a company has a consistent wage plan, whether or not highly technical, usually greatly reduces the number of disputes.

Wages Determined by Facts and Bargaining Skill

The Conciliation Service has found through its operations that the presentation of facts by both sides aids greatly a rapid settlement of a dispute. Many maintain, however, that wages are determined not by facts but by bargaining skill. Although we have no established policy on this point, we too believe in bargaining.

Bargaining for wages is ordinarily accompanied by a number of other conditions, such as hours, overtime, vacations, working conditions, and union recognition. Labor representatives, like other bargainers, may sometimes ask more than they expect to receive and management may sometimes offer less than they expect to give, in order to allow a margin for bargaining. Any condition the workers want or oppose becomes a bargaining point. The final wage rate agreed upon usually reflects the concession made on the various points by both sides.

Arbitration

Sometimes when a solution has not been reached through bargaining for wages, the Conciliator encourages the parties to submit their problems to arbitration. This is, of course, voluntary arbitration—both sides agreeing to arbitrate and to abide by the decision.

Since the very beginning of the Service, some Commissioners of Conciliation have served as arbitrators in situations involving almost every aspect of employer-employe relationships.

There are two principal types of arbitration cases. The first type of arbitration is the adjudication of some disputed interpretation or application of an existing agreement. This type of arbitration is probably destined for increased use with every passing year. It constitutes, perhaps, one of the most effective instruments for orderly relations between labor and management in a democracy which has legally recognized the desirability of having those relations on a collective bargaining basis.

The second principal type of arbitration is the adjudication, not of the meaning or application of an existing agreement, but of what some agreement, as yet uncon-

cluded, shall be. Sometimes the most untiring efforts of the best conciliator fall short of working out a final satisfactory solution of all the aspects of a controversy. In these situations—and they are comparatively rare—the parties will usually be encouraged to submit to arbitration the issue or issues upon which, even with the assistance of conciliation, they cannot come to complete agreement. They are encouraged, in short, to agree to arbitrate. Arbitration of this type has helped to solve many apparently deadlocked cases.

Cases Handled

During the twenty-nine years of its existence, the Conciliation Service has brought its voluntary methods of conciliation and arbitration to more than 36,000 situations involving more than twenty-eight million persons. During 1941, the Service disposed of 6,676 situations directly involving more than 4,625,000 workers. Of these situations, 4,725 were actual labor disputes (strikes and lockouts; threatened strikes and controversies) involving more than three and one-half million workers. Of these 4,725 labor disputes, over 90 per cent were satisfactorily disposed of by the Conciliation Service. The others, numbering about 318 were referred to other agencies such as the National Defense Mediation Board, the National Labor Relations Board, and other Federal and State agencies.

In all instances Commissioners of Conciliation who handle these cases are chosen for their knowledge and experience in the field of labor-management relations. They are stationed, in so far as is possible, in the important industrial and commercial centers. These Commissioners work on all types of cases: strikes, lockouts, threatened strikes, controversies, and sundry disputes. They come in on a case when requested by a representative of labor, management, or some public representative. When it is believed to be in the public interest, the Service may offer its assistance without a request.

Conciliation Service Co-operates with Defense

From the beginning of the defense program, the United States Conciliation Service has placed *primary* emphasis on bringing harmonious labor-management relations to situations directly affecting the national defense program. In order to facilitate this program, the Service designated nineteen of its most experienced Commissioners to work with certain vital industries. Liaison was established with the War and Navy Departments, Office of Production Management, the late National Defense Mediation Board, and later with the newly created National War Labor Board. All Commissioners have been instructed to give complete priority and uninterrupted attention to any defense situation assigned them and to report to Washington at least once daily on all such situations. An educational program has been advanced to show the importance to our democratic life of settling labor-management problems by a voluntary method. A new emphasis has been placed on preventive conciliation. Particularly difficult cases have been brought to the Washington office to speed settlement. And the Service has operated on an almost twenty-four hour day program.

National War Labor Board

A "no strike or lockout" policy was adopted for the duration of the war by the labor-industry conference called by the President on December 17, 1941. Following this conference, on January 12, 1942, the President issued an Executive Order creating the National War Labor Board.

The Order creating the Board set forth three steps for adjusting and settling labor-management disputes "which might interrupt work which contributes to the effective prosecution of the war": first, direct negotiations by the parties involved; second, conciliation by the United States Conciliation Service; third, mediation or arbitration by the National War Labor Board.

After the creation of the National War Labor Board, conferences between the Board and the Conciliation Service were held to establish a co-ordinated policy for handling disputes. It was decided that prior to the certification of any dispute to the Board, a Commissioner of Conciliation would be assigned to each dispute involving production or transportation of defense materials, and that this Commissioner would remain with the case until it was either settled or deadlocked. As provided in the Executive Order, in an event of deadlock, the Secretary of Labor would then certify the case to the National War Labor Board. The Executive Order also provided that the Board, at its discretion, after consultation with the Secretary of Labor might take jurisdiction of the dispute on its own motion.

Voluntary Methods Important

The objective of the Conciliation Service has always been to promote industrial harmony. The declaration

of war intensifies this objective and makes it more imperative. A war to uphold democratic processes and to defeat dictatorial methods of government makes the voluntary methods of conciliation and arbitration used by the Conciliation Service even more necessary. If coercion is permitted to become dominant in the settlement of labor disputes, the morale of all those who are struggling to maintain our free way of life will be immeasurably weakened. As production is continually speeded, the Service, therefore, will need to carry its program to more and more labor-management groups.

Panels

It had been a custom of the Department for many years to invite to Washington for conferences the parties to particularly serious disputes of critical national importance. In almost all cases, the conclusion of such conferences saw the attainment of an adjustment or, at least, the establishment of a definite basis for accord on issues over which the parties had previously appeared hopelessly at loggerheads.

Conferences of this type were frequently held after commencement of the nation's defense program. Then, a few months after creation of the late National Defense Mediation Board and in order to ease the burden of work upon the Board and prevent the piling up of unadjusted defense cases, the Service extended its practice of inviting to Washington the parties to major disputes which were not adjusted completely or quickly enough by the regular commissioners of the field. Not every case, of course, has been settled by this procedure. But, on the whole, results have been so satisfactory as amply to justify our continued and increasing utilization of this supplement to the more usual conciliation techniques.

From March 19, when the National Defense Mediation Board was created, until the first of this year, special Washington conferences were held under the auspices of the Service, in 113 cases; as of January 1, eighty of these cases had been settled, twenty-five had been referred to the National Defense Mediation Board, and eight were pending.

Preventive Conciliation

One of the most encouraging changes during the last few years is the growing trend to the use of preventive conciliation—that is, the use of conciliation before an open conflict develops. During the last year, over 2900 cases were called to the attention of the Service when they were in the threatened strike or controversy stage. 90 per cent of these cases were settled without stoppage of work.

Increasing Labor-Management Co-operation

Throughout the work of the Conciliation Service we have observed highly increased labor-management co-operation. In many instances, those who work and those who direct work are sitting down together for the first time—and finding they have much in common. This labor-management co-operation is, of course, less publicized than strikes, but probably destined to have greater significance in the nation's economy.

Freedom of movement is the essence of this American way of life into which we are now putting an all-out effort. This is a free flowing society. It is a give and take economy. It is an economy of production and distribution, of free speech, press, and religion.

As representative leaders of industry of the nation and as representatives of The Society for the Advancement of Management, the future holds for you the important task of leading the nation to a larger conception of a free flowing society and to a *post-war* period of increased co-operation.

When Wage Incentives Fail

By CHARLES A. DRAKE

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Part I: Individual Incentives

WAGES are paid to get work done. Wages are not paid, as a direct aim, to raise the standard of living, to reward labor for the so-called "pain" of its efforts, or to achieve social justice. Too often, in contemplation of this incentive theory of wages, we are likely to forget that there are other powerful stimuli that also operate to get work accomplished. We may then be astonished to discover that a considerable proportion of employes is not responding to what otherwise seems to be a wholly just and adequate wage-incentive system in our particular industry.

In one instance coming under observation, no less than 40 per cent of the direct labor employes failed to earn, over a period of five weeks, anything over the minimum wage set for the industry. At the same time some of their fellow-employes on identical jobs were earning bonuses amounting to 50 per cent of the minimum wage. Such a situation is probably unusual, but it differs in degree only from the usual situation and deserves careful analysis for the light it may throw on the instances that are more common.

Some of the non-bonus-earners are outspoken in their assertion that they are satisfied to earn only the minimum guaranteed wage. Part of these consist of younger workers, particularly young women, who turn all of their earnings over to their parents and receive a fixed allowance for themselves in return. Among these the failure to try harder to achieve a bonus is understandable, if not commendable. To overcome this indifference some have proposed that the individual bonus be paid to the worker in a separate envelope, to do with as he sees fit.

There are others among the non-bonus group who are learners or new employes who have not yet attained the standard speed and skill. The solution of their problem is primarily achieved through further training, more careful supervision, and encouragement. Their final potentialities are unknown, but we must give them the benefit of the doubt.

Still another part of this non-bonus group consists of employes who are lacking in the abilities required by their particular jobs. Often they try hard to beat the minimum standards, but without notable or sustained success. Analyses by test usually show them to be deficient in one or both of the areas of aptitude involved in the work: in basic dexterity of the particular kind called for, or in perception of the kind and degree needed for good performance. Sometimes this latter, where the perception is visual, is aggravated by defective eyesight.

Obviously the best way to handle this group is through more selective employment, using tests of the abilities required, and by assigning to the work only those who have these abilities in adequate amount. Suitable tests give a positive assurance that the persons possess the basic abilities required, but they are still no guarantee that the employe will respond favorably to the supervisor, to the social environment with other workers in the work place, or to the wages paid as the primary incentive. Management still has the task of liberating these abilities to accomplish the work.

The most serious problem is presented by the part of the group that belongs in none of the above categories. These are the workers who possess the abilities required, who have been on the job a long time, who hold or spend as they please the amount they receive, but who are satisfied to earn on the incentive-wage standard just enough to equal the minimum guaranteed wage. These constitute a real challenge to good management, a challenge to make them respond to the incentive-wage plan or to some other incentives for their own advantage.

Often these employes present instances of stereotyping of production over a long period of time. They produce just about the same quantity and quality under the recently established wage incentive system that the records show they had been producing on a day-wage basis. Revision of wages upward by the Wages and Hours law has affected their production not at all—as indeed it has not affected the production of workers in the other categories. Their established habits are highly resistant to incentives.

This tendency to establish definite work habits, especially habits relating to the methods and speed of work

on the job, is not confined to this part of the working force. It is the fact that lies behind much of the opposition to the hiring of older workers, to employment or transfer of workers from certain other industries, and to the employment of individuals of certain races or nationalities.

These marginal workers—producing just enough to meet the minimum standard—present a curious set of attitudes and rationalizations of their situation. They "aren't going to be suckers for any speed-up"; or "They'll cut the rate soon, anyhow. They'll only let you earn day wages."; or "I do a day's work for a day's pay, don't I?"; or, sometimes, "What's the use, I'm satisfied." Behind these remarks lies a mass of stored-up dissatisfaction, suspicion and resentment, all growing out of injustices of the past, real or fancied.

It is a long and difficult task for management to overcome the sentiments born of past injustices—and imagined wrongs are just as potent as real ones. A piece rate unscientifically established and then arbitrarily cut is often enough to retard or even ruin the whole incentive system. A promise made, or understood to be made, and not kept, may be a potent cause of ill will. An unfair advantage taken in setting rates, assigning tasks, or distributing favors may rankle in a man's bosom for years and breed enduring resentment. The most natural—even unconscious—result is lack of enthusiasm for any new plan or effort of management, a result that is reflected in mediocre performance.

The same effect is noted in some instances where strike settlements have resulted in far fewer benefits to the workers than they had expected or were promised. Only part of such disappointment is expressed against their leaders, their organization, or their fellow-workers. It is usually not clear to workers that wage negotiations and strike settlements frequently involve compromises in which both sides give up some of their demands. Hence they feel that anything their leaders give up is something to be resented.

Perhaps even more pervasive, but often overlooked because of our poor knowledge of industrial physiology, is the fact that the optimum speed of production for most workers may be at or near the minimum standard set by time study techniques. This optimum speed is the most comfortable speed of work for long sustained application. This is such a familiar phenomenon that we are prone to overlook its importance.

Each of us has a certain most comfortable speed for walking or for driving a car on the open road. When overtaking others moving more slowly, we become impatient and insist upon passing. Attempting to follow another person moving at a higher rate, we have difficulty, feel under pressure, strained, harassed. This undoubtedly has a parallel in industry where the complaints against the "speed-up" come from the individuals whose optimum speed is below the rate at which the work is being done—again a case for correction through selection by suitable tests.

Any inference that nothing can be done about these workers of below-average optimum except to eliminate them in the employment procedures is not correct. Better selection and more suitable placement would certainly solve part of the problem. We do not know if an optimum speed of performance can be permanently raised, or if raising it would be worth what it might cost. We do know, however, that many workers who apparently belonged to this average category have broken out of it and into the ranks of the bonus-makers, seemingly permanently and without evidence of injury or even discomfort. But the necessary incentive had to be employed.

Superhuman tasks have been performed by men under the influence of suitable incentives. Mythology is largely composed of narratives of such deeds inspired by love, by hate, by avarice or by revenge. Less picturesque and romantic, but far truer and more common, are similar achievements of men and women around us every day. The hero has in superlative degree only what we all have that makes us kin as humans. Human nature is forever the same, only people are different.

Our task, then, is to apply the incentive, or still better, the combination of incentives that will give the response we want in the work to be done. We are not looking for the superhuman, only for the better-than-before performance. We still know too little to write the formula for any one person, with so much in wages, so much in praise, so much in status, so much in security. But we should know how to experiment with these items in each individual case, and we certainly should attempt to use them all in so far as they may help us.

Wages we take as one of the stimuli, without question, but wages determined by custom, by bargaining, by law, without much attempt to measure their efficacy as incentives until we note that they are failing to get results. To the base wage we attempt to add something for better performance on some allegedly scientific but usually only systematic basis. Often this works on the average, but fails conspicuously with certain individuals.

With security as a motive we did less well. A few foresighted managements recognized this motive and

made it effective through elaborate systems for their organizations. Governments accepted the principle, more in the interest of social justice than as direct incentive, and set up parallel or superseding systems. Yet continuous employment at acceptable wages still has a high incentive value when properly sold—presented to and accepted by—the worker on the job. Our failure is too often, in this, a failure to sell such security as an incentive.

Status we usually handle clumsily, when we handle it at all. Oversimplified, it amounts to phony or insignificant titles, nameplates, and spurious duties and responsibilities. Overbrutalized, it is reflected in the arbitrary right to "hire and fire"—to rule by fear. Overrefined, it manufactures an unnecessary hierarchy of authority in which every individual has a designated place—and in which function is neglected in the interest of position.

Status operates most effectively when a man has recognized rights that others must respect—one of the most powerful reasons for labor unions. It operates to get respect from others for one's ability or accomplishments—the deference due the master of a skill, or the ability of the leader. It is reflected in certain perquisites of rank, some of them traditional such as the right to wear a hat in the work place, lunch within the roped-in area in the lunch room, or relief from the need to punch the time clock. But the possible area that could be profitably cultivated has as yet only been scratched. Buttons and brassards, uniforms and insignia, order and precedence, preferred hours and duties, and many others have barely been touched experimentally, and the usual manager cannot add to the list.

And praise of the worker to the worker! How rare it is, and for that reason how precious! So often deserved, so easy to bestow, and—perhaps its greatest drawback in achieving more popularity in practice—so economical to the giver. Given cheaply, it is worth just what it costs. Yet given judiciously where deserved and in the proportion deserved, it works wonders. It is seldom lost, a fact that makes it different from the money sometimes put into wages alone.

We cannot—did not intend—to enumerate all the elements that may enter into the final incentive equation. Nor can we state just how much of each of these available incentive elements will enter into any individual's equation. But we are now in a position as never before, with wages pushing to higher levels, to try these others experimentally. For, as the wage level goes higher, the law of diminishing returns operates to make each succeeding dollar less effective as an incentive. At the same time, with more workers, more haste, more attention to the work and less to the man, the other incentives take on increasing importance and value. A little praise is now worth more than a year ago; a little status in a big, new organization can be made effective; security is enhanced rather than diminished in value.

This is mathematically sound:

100 per cent adequate wages = 100 per cent performance

This should be true:

100 per cent wages + 50 per cent deserved praise = 100 per cent plus performance

But this is certain:

100 per cent wages + 100 per cent deserved praise + 100 per cent deserved status + 50 per cent (average) security = 100 per cent plus performance

Here are some of the terms of the incentive wage equation. And it is wisdom to remember that good management will apply this equation in practice.

Leon Pratt Alford

January 3, 1877 **January 2, 1942**

Death claimed Dr. Leon Pratt Alford on January second, the day before his sixty-fifth birthday. The suddenness of his going was characteristic of the passing of his famous predecessors and friends, Gantt and Gilbreth, who died "with their boots on." Dr. Alford had lived a life rich in attainments, which he shared unsparingly with others. Only three days before the end he had played host and given counsel to a notable group of educators in industrial management.

Born in Simsbury, Connecticut, of a long New England lineage, he studied electrical engineering and was graduated from Worcester Polytechnic Institute in 1896. In 1932 that same institution conferred on him the honorary degree of doctor of engineering. He entered industrial employment and spent the years from 1896 to 1907 in various shoe manufacturing companies in Boston, rising from shop foreman through production superintendent to mechanical engineer.

In 1907 he entered the field of engineering journalism and began a career that shaped the future course of his life. He became engineering editor of *American*

Machinist and from 1911 to 1917 was its editor-in-chief. During these years he was the author of a book on bearings and their lubrication, and editor of a book on artillery and artillery ammunition. These writings were in keeping with the character of the paper he was editing and with his experience in machine building. However, he was not destined to follow this course. During these ten years in New York he met Taylor, Gantt, Gilbreth and others who had pioneered in scientific management, and found himself in congenial company. These men and the philosophy they espoused gave new directions to his own thinking and shaped his ultimate career.

From 1917 to 1928 he was editor successively of *Industrial Management, Management Engineering,* and *Manufacturing Industries.* The last two papers were published by Ronald Press Company, of which he was vice president from 1922 to 1934. With editorial skill and a clarity of vision he helped to interpret and classify the principles and so-called "laws of management" which were embodied in the teachings and practices of the pioneers. This was given expression in *Management's Handbook* 1924, and *The Laws of Management* 1928. Recognition of his contributions came in the award of the Admiral Melville Gold Medal in 1927, and of the Henry Laurence Gantt Gold Medal in 1931. *Cost and Production Handbook* was published under his editorship in 1934 and in the same year he wrote *The Life of Henry Laurence Gantt.*

It may be said that Dr. Alford lived and practiced the cause that he preached, for his counsel was ever sought and freely given to the affairs of civic and professional societies. He was vice president and member of the research committee of the American Engineering Council, which produced the report on Waste in Industry, Twelve-Hour-Shift in Industry, Safety and Production in Industry, and Technological Changes in Manufacturing Industries. He was a Fellow and past vice president of The American Society of Mechanical Engineers, who performed a labor of love on important committees and was revered as the elder statesman of its management division. The Society rightfully recognized his contributions to management and his service to itself by conferring upon him at the last annual meeting in December, its certificate of honorary membership. He was a Fellow and past president of the Institute of Management, member of the National Association of Cost Accountants, the Society for the Promotion of Engineering Education, and the honorary society of Sigma Xi.

In 1935 he became chief engineer of the Silk Textile Work Assignment Board which effectively determined proper work assignments that were accepted by both labor and management. In the same year he became associate engineer in charge of manufacturing costs unit of the Federal Communications Commission, and during the next two years made exhaustive studies of the costs of manufacturing communication equipment. The results of this investigation brought about an adjustment in rates that was of benefit to the public.

New York University's College of Engineering called him in 1937 to be professor of administrative engineering and chairman of the department of industrial engineering. He instituted graduate courses leading to the master's degree and broadened the undergraduate curriculum, changing its name to administrative engineering.

That Dr. Alford was a real teacher is best confirmed by the words of his own students. The following quotation from the New York University Heights Daily News of January 6 is a letter written to that paper by a committee of three students:

> Many people go through life without discovering the purpose of living, but a scattered few not only discover the spirit of living, but demonstrate it in their lifetime. Such a man was Dr. Alford. The goal of his life was service to humanity.
>
> The service he rendered to humanity was not limited only to imposing matters, but was extended to include the little everyday human affairs of individuals. To most of the students who had any contact with him, Dr. Alford was not just the head of his department, he was perhaps their sincerest counsellor and friend at all times, so much so that at a recent Christmas party conducted by the department it was made known that he had been for some time affectionately and respectfully called "The King."
>
> It is felt that an irreparable loss has been suffered by all of his students both because of the man's professional ability and his warm and sympathetic display of humanity and power.

REVIEWS

Management and Morale. By F. J. Roethlisberger, Harvard University Press, Cambridge, Massachusetts, 1941, pages xxii, 194. ($2.00.)

Reviewed by MORRIS S. VITELES, *Professor of Psychology, University of Pennsylvania.*

To readers familiar with the series of publications on the modern industrial scene by Professor Elton Mayo, T. N. Whitehead, the present author, and their associates at the Harvard University School of Business Administration, the thesis and contents of this book will not be new. Once again the author stresses the need for management to consider the inter-personal, social phenomena in industrial organization as well as the technical problems of industrial production. As in Whitehead's *The Industrial Worker,* and in Roethlisberger and Dickson's *Management and the Worker,* there is again an appeal that the problems of industrial relations be treated as human problems to be solved by means of human data and human tools. Repeated are the basic principles that as "Industry is a social as well as economic phenomenon"; and that "the social structure of any particular company determines the kind of collaboration, the kind of people who will stay in the company, and the kind of people who will reach the top," which have been evolved, in part, on the basis of the extensive experimental studies conducted at the Hawthorne Works of the Western Electric Company.

The material does not suffer by repetition, particularly since the material is presented here primarily for the lay reader. As a matter of fact, *Part I* (Chapters 1 to 7) consists of addresses originally presented to groups of businessmen with the essential purposes of calling to their attention "a neglected area of consideration regarding problems of human collaboration" and of outlining "a point of view which can be simply but effectively practiced in their shops and offices, in factories, retail stores, and banks."

Chapter II, "The Road Back to Sanity," which follows a brief introductory chapter, reviews the original Hawthorne researches whose results led to the study of the workers' sentiments as affecting behavior and to the "interviewing" method as a technique for obtaining information as to those sentiments.

Chapter III, "Understanding: A Prerequisite of Leadership," describes the properties of sentiments and their influence upon collaboration between the social groups in industry.

Chapter IV, "The Social Structure of Industry," defines "social behavior" and through a comparison of primitive and modern industrial organization underlines the importance of the social structure.

Chapter V, "A Disinterested Observer Looks at Industry," describes the observations of a hypothetical "foreign" observer as he studies a typical large-scale industrial organization,—observations which reveal the stereotyped thinking characteristic of theoretical economists, and of top management and the worker, which prevent them from understanding each other's attitudes and problems.

Chapter VI, "Of Words and Men" discusses the general functions and limitations of language, with particular emphasis upon difficulties arising in truly understanding what people say. Suggestions for the development of skill in interviewing workers are also discussed in this chapter.

Chapter VII, "What is Adequate Management?" defines the main problem of industrial organization as that of securing the co-operation of people in attaining its collective purpose, and outlines the three subordinate problems of *communication* (among levels within the organization), of *maintenance of a condition of balance* within the organization, and of *effecting individual adjustments,* which arise in securing co-operation. The need for trained personnel to study these problems is stressed and concrete suggestions presented for dealing with them.

In Part II (Chapters 8 and 9) the author relates the observations and comments scattered through the individual addresses to the larger framework of sociology and economics. Particular emphasis is placed upon the schism separating the academic theorist from the practitioner and on the extremist tendency of the theorist to conceive of the characteristics of the individual either apart from his social milieu or else as a fixed resultant of his early "social conditioning." As a result of this schism, the demands the person is making of the social situation as well as the demands of the social situation upon the person are neglected by the theorist and his theories fail to represent co-operative phenomena as the executive intuitively experiences them.

The final chapter, "Management and Morale" presents the thesis that underlying the whole problem of morale in the business situation is the neglect of the "social situation." To build morale attention must be centered upon: (1) "the daily problems of maintaining internal equilibrium within the organization,"—viz. maintaining "that kind of social organization in which individuals and groups through working together can obtain human satisfactions that will make them willing to contribute their services to the economic objective of co-operation; and (2) the daily problems of diagnosing possible sources of interference, of locating sore spots, of liquidating human tensions and strains among individuals and groups of helping people to orient themselves to their work groups, of spotting blockages in the channels of communication."

This book should be of interest to a wide variety of readers. To the social psychologist, it presents penetrating observations concerning human behavior in the social milieu; to the economic theorist, it presents a strong case for the enlargement of present economic theory to include the social as well as economic organization of modern industry. To the student of industrial relations and to management a point of view is developed which merits serious consideration in clarifying the sources of grievance between labor and management.

The Managerial Revolution. By James Burnham, The John Day Company, Inc., New York, 1941, pages 285. ($2.50.)

Reviewed by HERMAN FELDMAN, *Dean, School of Business and Civic Administration, College of the City of New York.*

This book of facile contentions should be divorced from its challenging title and it would be clearer if it omitted the word "manager" entirely from its pages. The author, once active in the Trotskyist political organization, believes that we shall have

a dictatorship controlling much or all of our economic life and be ruled by government officials rather than by the owners or managers of individual businesses. In spite of much explanation the author's conception of the managers is hardly distinguishable from that of the bureaucracy of any government. And it is nothing new to point out that if we do have a dictatorship, Fascist, Nazi or Communist, a certain group of officials will order us about. Hence, in spite of the stir the book has created, its message is commonplace.

The misuse of the term "managerial society" regrettably also leads to confusion of thought. The real rulers in a dictatorship will not be the executives called into positions because of their technical knowledge or capacity for business management. These people will be only incidental to the Hitlers, Stalins, Mussolinis and their "elite" or enlightened vanguard of zealots, propagandists and strong men who engineered the coup d'etat. To say that "managers will strengthen and consolidate their social position, and will establish society on a strong basis that will guarantee their rule," (p. 160) in the sense that the word "managers" is normally understood, might make sense only if it suggested an analogy to military careerists who undermine a political government. But no such prediction is intended.

Much of the book is Marxian in tone and spirit and full of brash contentions and misconstructions that are hard to swallow. For instance, how valid is the alleged superiority of Germany in eliminating unemployment? All we know is that Germany accomplished this by preparing for war, and democracies in emulating Germany are achieving the same momentary "prosperity" —as is indeed shown by the labor shortage already developing. Similarly, praise for Germany's ability to exploit backward areas does not take into account that if democracies used the predatory one-sided trade pressure exercised by the Germans on the Balkan states, the same results would follow.

All this kind of interpretation does not deserve identification with the term "managerial society." The book is discursive on many subjects but it has no relation to the current conception of management as a scientific art.

My Life in Industrial Relations. By Clarence J. Hicks, Harper and Brothers, New York and London, 1941, pages x, 180. ($2.50.)

Reviewed by E. H. VAN DELDEN, *Assistant Professor of Management, Graduate School of Business Administration, New York University.*

The author states in the preface "a man's philosophy of human relations is but a part of himself. It becomes so over a long span of years during which he is immersed in changing environments, facing new problems and working with many people." This statement, in the opinion of the reviewer, epitomizes the book: Clarence J. Hicks enjoyed an interesting, pleasant and colorful life and therefore his philosophy of labor relations is interesting, pleasant and colored.

Had the author been born the son of a miner in one of the mining towns of the Colorado Fuel and Iron Company (and perhaps lost his parent in the "Ludlow massacre" which the author mentions so casually) instead of growing up in a pleasant farming community where his father was a "working partner in a wagon shop which included a blacksmith shop, a trim shop, and a paint shop," there can be little doubt but that his life and his philosophy would be different. One has but to compare this book with the biographies of several of our outstanding present-day labor leaders in order to gain an insight into the environmental forces that mould the thoughts of men.

This book is the autobiography of a pioneer in the field of labor relations and should be of interest to the research historian in that field. It should also be valuable to those interested in a philosophy of industrial relations inasmuch as it presents the accumulated thoughts of a man whose ideas have vitally affected the profession of which he is an acknowledged leader.

Mr. Hicks devotes considerable space to a discussion of the values of the employe representation idea, of which he heartily approves, and of the deficiencies of the closed shop, which he thoroughly dislikes. The chapter on the "Fundamentals of a Sound Company Policy" could be read with undoubted profit by many employers and the chapter on the "Industrial Relations Executive" likewise contains much of value for many of those now in the profession or those aspiring for a place therein.

The style is rambling as one would expect in a personal narrative of this type, but the book is easy to read. There is a tendency to touch lightly upon many subjects that could apparently be explored further with much profit. One gains from this practice an impression of interaction instead of cause and effect. It is like watching a night football game in which one of the teams appears almost invisible. One sees players stopped and kicks blocked without quite knowing why. It is this selection of the material presented which is apt to leave the reader with the erroneous feeling that all could be sweetness and light in industrail relations were it not for the National Labor Relations Act.

The New Centralization. By George C. S. Benson, Farrar and Rinehart, Inc., New York, 1941, pages xii, 181. ($1.50.)

Reviewed by KARL E. STROMSEM, *Assistant Educational Director, National Institute of Public Affairs.*

In this study of intergovernmental relationships in the United States Professor Benson considers the arguments usually advanced for and against decentralization; he surveys and evaluates the changing relations between national, state and local governments, particularly those of the last decade; and in an epilogue he advances a twelve-point program for American decentralization. Basic in his program are proposals for an increased size of local units; an improved quality of state legislative and administrative activities, including better supervision of local units; further development of the system of grants-in-aid from the national government to the states, and from the states to local units; and improvement of national administration by regularization of procedures, development of regionalism, and the like.

In a study as brief as this, such a program is offered without specific means for accomplishment. Furthermore, the subject of decentralization is vast and its problems are complicated with economic and social as well as political and administrative implications. There is such a recognition in the book, but too

little to give a clear understanding of the dynamics of the subject. While there are such limitations, this study will be useful to those who wish a brief analysis of the problems of intergovernmental relationships and a survey of the developments of the last few years.

Personnel Management, Principles, Practices and Point of View. (3rd Edition.) By Walter Dill Scott, Robert C. Clothier, Stanley B. Mathewson, and William R. Spriegel, McGraw-Hill Book Company, Inc., New York and London, 1941, pages xii, 589. ($4.00.)

Reviewed by CARROLL E. FRENCH, *Assistant to Director, Industrial Relations Counselors, Inc., New York.*

In the third edition of this work, first published in 1923 and revised in 1931, the authors have endeavored to take account of the major developments in personnel administration and industrial relations during the past ten years, particularly the mass of social and labor legislation, the discoveries and advances in the field of industrial psychology, and management's attempts to adjust their practices and policies to these new factors.

Parts I, II and III cover the development of personnel management, instruments of personnel control, and education and training. Specifically, the more important subjects treated include the organization and function of a personnel department, employment procedures and records, personnel policies, problems in transfer, promotion and discharge, job and supervisory training, employment tests, aptitude and interest tests, merit rating, job analysis, classification and job rating. Part IV, headed "Employee Incentives," treats the subjects of wage and salary control, wage payment plans, financial aids to employes, and safety, health and recreation. New material in this edition is found in Part V, "Industrial Democracy and Social Controls," under which problems of employe representation, including labor unions and collective bargaining, the National Labor Relations Act, the Fair Labor Standards Act, stabilizing employment, and pension plans, are treated. One of the most interesting and valuable contributions to this edition is a survey of the status of personnel management in 231 companies, the results of which are presented in Appendix A.

Over 302 pages out of the 516 are taken up with the personnel department, employment records, judging men, education and training, and, particularly, the applications of psychology to employe testing, rating and morale appraisal. In general, the principles of organization and personnel administration set forth are sound and in accord with the best of modern practice. The sections on employment tests, merit rating, aptitude and morale appraisals are particularly comprehensive, and there is an excellent presentation of the provisions of both federal and state labor legislation and of the requirements of the Wage and Hour Act.

Throughout the book the staff and advisory nature of the personnel director's responsibility is stressed. There are still some competent personnel administrators who are inclined to reach for line authority, and the authors have rendered a much needed service in keeping the soundness of the staff relationship to the foreground.

The major weakness of the book is its failure to take full account of the impact on personnel administration of the rise of organized labor and collective bargaining. It is a disappointment to find so little attention given to such urgent problems as seniority, supervisory training, problems of shop discipline, grievance adjustment procedures, the applications of job analysis to wage structure, the implications of the closed shop, collective bargaining policies and techniques, and the difficulties involved in maintaining friendly relationships with rank and file employes. The problem of founding a program of promotion and tenure on the basis of merit has not been given the attention it deserves, and the treatment of such problems as seniority and the service factor in wage setting is, to say the least, weak and of questionable soundness. Faulty arrangement of material has somewhat impaired the effectiveness of treatment as, for example, the handling of the discussion of safety, health and recreation under the heading of "Employee Incentives," pension plans under the head of "Industrial Democracy," and job analysis, classification and rating in a section apart from "Wage and Salary Control."

The outstanding contribution of this work lies in the field of the more technical and highly specialized phases of personnel administration. These are particularly the fields in which the findings and researches of the industrial psychologist have their greatest application. A wealth of valuable information is presented and the book should be extremely helpful not only to students of personnel administration but to those engaged in actual administration.

How to Interview. (Third Revised Edition.) By Walter Van Dyke Bingham and Bruce Victor Moore, Harper & Brothers, New York and London, 1941, pages ix, 263. ($3.00.)

Reviewed by MATHIAS LYNAUGH, *Psychology Extension Division, Columbia University.*

This third edition of *How to Interview* has been extensively revised and is especially suitable for use in training of interviewers, particularly in the business, industrial and general employment fields. The treatment of the subject is from the standpoint of method, with minor emphasis upon the content of the interview. Appendices and long bibliographies have been omitted in favor of a select list of references. The result is to present a readable and instructional text which draws heavily upon the more recent studies in applied psychology.

The major theme of the book is that interviewing must be done with a definite purpose and the chapters are divided by the nature of the interview. The first two chapters cover general principles, the chapter on "Learning How to Interview" being completed with fifty-five separate suggestions for improving interview technique. The remaining chapters include topics such as student interviews, occupational adjustment, employment, oral examinations, public opinion polls, social case-work, clinical, journalistic and legal evidence interviews.

Nine of fifteen chapters are particularly useful in the business and industrial field, for employment interviewers, personnel men and others who use the interview method even with considerable experience and training. Included in this section is a significant chapter on the interview as applied to employer-employe relations.